

CAI
IB 46
-14 B 25

Canada, Topographical Survey
[Bulletin no 25]

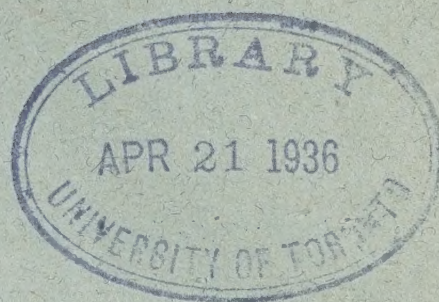
Government
Publications

DOMINION OF CANADA
DEPARTMENT OF THE INTERIOR
TOPOGRAPHICAL SURVEYS BRANCH

DESCRIPTION OF SURVEYED LANDS

IN THE

RAILWAY BELT OF BRITISH COLUMBIA



PART No. 1—EASTERN DIVISION.

Printed by authority of the Minister of the Interior
DECEMBER, 1914

DOMINION OF CANADA
DEPARTMENT OF THE INTERIOR
TOPOGRAPHICAL SURVEYS BRANCH

DESCRIPTION OF SURVEYED LANDS

IN THE

RAILWAY BELT OF BRITISH
COLUMBIA

PART No. 1—EASTERN DIVISION.

Printed by authority of the Minister of the Interior
DECEMBER, 1914

PREFATORY NOTE.

The information contained in this pamphlet consists of reports and field notes of Dominion Land Surveyors who were sent out by the Interior Department.

The townships are placed in order of ranges, the number of the ranges and townships in heavy figures on the left side.

* * *


The report is published in three parts. The territory comprised in Part No. 1 is the easterly section of the Railway Belt, including the Upper Columbia, Lower Columbia and Shuswap Lake divisions, extending from the boundary of the province of Alberta to the western boundary of range 15, west 6th. Part No. 2 comprises, roughly speaking, the Dry Belt or central portion. Part No. 3 comprises the Coast division.

* * *

The first portion of the pamphlet consists of each surveyor's report on the whole season's work, and general information and description of the district examined. In the last portion the information is given by section, township and range in numerical order, commencing at range 18, west of the 5th meridian, and concluding at range 15, west of the 6th meridian. In this way individual townships to which it is desired to refer can be readily located in the second portion of the pamphlet.

E. DEVILLE,
Surveyor General.

OTTAWA, December, 1914.



Digitized by the Internet Archive
in 2022 with funding from
University of Toronto

<https://archive.org/details/31761115575276>

EXPLANATION AS TO THE RAILWAY BELT.

The Railway Belt is a strip of land forty miles in width following the main line of the Canadian Pacific railway in British Columbia, being twenty miles on each side of the railway from the boundary of the province of Alberta on the east to a line drawn approximately north and south from the city of New Westminster at the Pacific coast. The Railway Belt contains an area of 17,150 square miles, or 10,976,000 acres. It was transferred to the Dominion by the province of British Columbia by provincial statute of 19th December, 1883. (Chapter 14, 47 Victoria.)

This tract of land is a mountainous region and divides itself into five main divisions dominated by topographical conditions, comprising from east to west: (1st) the Upper Columbia division, being the valley of the Columbia river north and south of Golden; (2nd) the Lower Columbia division, being the valley of the Columbia river north and south of Revelstoke; (3rd) the Shuswap Lake division; (4th) the Kamloops division or Dry Belt; and (5th) the Coast or New Westminster division.

Considerable diversity as to climatic, timber and soil conditions, and as to altitude, exists in the different divisions of the Railway Belt; for instance, the rainfall in the Coast division is very heavy, fostering the growth of giant timber. In the next division to the east, the Kamloops division, there is a deficiency of rainfall, and for the most part cultivation without irrigation is impracticable, although within recent years considerable progress has been made by dry-farming methods; the timber conditions are very light, and large tracts of country are utilized for grazing purposes; this division is usually known as the Dry Belt. In the divisions to the east of the Dry Belt rainfall is usually normal, and the entire areas are well forested.

The lands suitable for settlement consist for the most part of the bottom and bench lands along the innumerable valley systems of lakes, rivers and creeks, usually of a high degree of productivity. A very large proportion of the total area is of great altitude, rough or unproductive in character, or suitable only for forest growth.

During the past few years survey parties have been at work in various divisions of the Railway Belt for the purpose of extending surveys and classifying lands which might be deemed suitable for settlement. These reports during the progress of the work were placed in the hands of the Dominion Lands Agents and are now compiled in printed form as far as survey work has proceeded.

Lands in the Railway Belt are administered by the Dominion Government. Water rights in the Railway Belt are under the provincial administration at Victoria, B.C. Considerable areas in the Railway Belt are set apart as Forest reserves and Dominion parks. Settlers or others desiring information should apply to the Dominion Land and Timber Agents at New Westminster, Kamloops and Revelstoke, B.C.

INDEX TO SURVEYORS' REPORTS CONTAINED IN THIS PAMPHLET.

	PAGE.
Adams lake, Report by A. O. Wheeler, D.L.S., surveys season '09.. . . .	102-105
“ “ E. W. Robinson, D.L.S., surveys season '09.. . . .	115
Adams lake and river, Report by R. D. McCaw, D.L.S., surveys season '09.. . . .	105-107
“ “ J. E. Ross, D.L.S., surveys season '09.. . . .	107-109
Blaeberry Creek Valley, Report by J. A. Kirk, D.L.S., surveys season '06.. . . .	68-70
Botanie Creek Valley, Report by J. E. Ross, D.L.S., surveys season '08.. . . .	87-90
Bush lake, Report by N. C. Stewart, D.L.S., surveys season '12.. . . .	130
Charcoal Creek Valley, Report by J. E. Ross, D.L.S., surveys season '08...	87-90
Chase Creek Valley, Report by J. E. Ross, D.L.S., surveys season '08.. . . .	87-90
Columbia River Valley, Report by J. E. Ross, D.L.S., Golden District, season '07.. . .	71-73
“ “ M. P. Bridgland, D.L.S., North and South of Golden season '08.. . . .	73-78
“ “ M. P. Bridgland, D.L.S., North and South of Golden, season '09.. . . .	93
“ “ T. H. Plunkett, D.L.S., Golden District, season '09..	114
“ “ W. J. Deans, D.L.S., Golden District, season '10..	125
“ “ N. C. Stewart, D.L.S., Golden District, season '12..	128-131
“ “ H. G. Wheeler, D.L.S., North and South of Revel- stoke, season '08.. . . .	78-83
“ “ T. H. Plunkett, D.L.S., Revelstoke District, season '09	113
“ “ E. W. Robinson, D.L.S., Revelstoke District, season '09	116
Deep Creek, Report by N. C. Stewart, D.L.S., surveys season '12.. . . .	130
Eagle River Valley, Report by E. W. Robinson, D.L.S., season '08.. . . .	109-112
Eagle Pass and Eagle River, Report by A. J. Campbell, D.L.S., season '09.. . . .	99-102
Gold River, Report by N. C. Stewart, D.L.S., surveys season '12.. . . .	128-131
Grande Prairie, Report by J. E. Ross, D.L.S., surveys season '09.. . . .	107-109
Harper lake “ “ “	107-109
Ingram Creek “ “ “	107-109
Mabel lake, Report by T. H. Plunkett, D.L.S., surveys season '10.. . . .	122
“ “ N. C. Stewart, D.L.S., surveys season '12.. . . .	128-131
Mara lake, Report by J. E. Ross, D.L.S., surveys season '09.. . . .	107-109
Martin Mt. Forest Reserve, Report by A. V. Chase, D.L.S., surveys season '10.. . . .	254
Meadow Creek, Report by J. E. Ross, D.L.S., surveys season '09.. . . .	107-109
Monte Hills Forest Reserve, Report by A. V. Chase, D.L.S., surveys season '10.. . . .	278
Monte Creek, Report by A. J. Campbell, D.L.S., surveys season '09.. . . .	99-102
North Thompson Valley, Report by J. E. Ross, D.L.S., surveys season '08.. . . .	87-90
Pass Creek, Report by A. O. Wheeler, D.L.S., surveys season '09.. . . .	104
Photo-Topographical Surveys in Rocky Mts., A. O. Wheeler, D.L.S., seasons '05, '06, '07..	1-19
Salmon Arm (North Shore), Report by A. O. Wheeler, D.L.S., surveys season '09.. . . .	103
Salmon River Valley, Report by A. J. Campbell, D.L.S., surveys season '09.. . . .	99-102
“ “ J. E. Ross, D.L.S., surveys season '09.. . . .	107-109

	PAGE.
Scotch Creek, Report by A. O. Wheeler, D.L.S., surveys season '09.. . . .	103
Shuswap Lake District, Report by J. E. Ross, D.L.S., surveys season '07.. . . .	71-73
" " A. O. Wheeler, D.L.S., surveys season '08.. . . .	83-87
" " A. O. Wheeler, D.L.S., surveys season '09.. . . .	90-93, 102-105
" " T. H. Plunkett, D.L.S., season '09.. . . .	112
" " T. H. Plunkett, D.L.S., season '10.. . . .	119
" " W. J. Deans, D.L.S., surveys season '10.. . . .	123
" " D. A. Smith, D.L.S., surveys season '10.. . . .	126
" " M. P. Bridgland, D.L.S., surveys south of Shuswap lake, season '09.. . . .	93-99
" " R. D. McCaw, D.L.S., surveys, Little Shuswap lake, season '09.. . . .	105-107
" " J. E. Ross, D.L.S., surveys Little Shuswap lake, season '09.. . . .	107-109
" " E. W. Robinson, D.L.S., surveys Shuswap river, season '09.. . . .	118
" " N. C. Stewart, D.L.S., surveys Shuswap river, season '12.. . . .	128-131
South Thompson River, Report by A. J. Campbell, D.L.S., surveys south of the South Thompson river, season '09.. . . .	100
" " R. D. McCaw, D.L.S., surveys north of the South Thompson river, season '09.. . . .	105-107
Triangulation Surveys in the Railway Belt—	
Upper and Lower Columbia, Report by P. A. Carson, D.L.S., seasons '06, '07, '08, '09.	19-57
" " M. P. Bridgland, D.L.S., seasons '10, '11, '12.	57-68
Weather Reports, <i>See</i> Appendix.	

LIST OF TOWNSHIPS, REPORTS OF WHICH ARE CONTAINED IN THIS PAMPHLET.

WEST OF THE FIFTH MERIDIAN.

<i>Townships.</i>	<i>Range.</i>
23, 24	18
23, 24, 25	19
24, 25	20
25, 26, 27	21
26, 27, 28	22
28, 29, 30	23
29, 30, 31	24
29, 30, 31, 32	25
31, 32	26
32	27
20, 21	29

WEST OF THE SIXTH MERIDIAN.

<i>Townships.</i>	<i>Range.</i>
21, 22	1
22, 23, 24, 26, 27	2
23,	3
22, 23	4
19, 20, 21, 22, 23	5
19, 22, 23	6
18, 19, 21, 22, 23, 24, 25, 26	7
18, 19, 20, 21, 22, 23, 24, 25, 26	8
17, 18, 19, 20, 21, 22, 23	9
17, 18, 19, 20, 21, 22, 23	10
17, 18, 19, 20, 21, 22, 23, 24, 25	11
17, 18, 19, 20, 21, 22, 23, 25	12
16, 17, 18, 19, 20, 21, 22, 23, 24	13
16, 17, 18, 19, 20, 21, 22, 24, 25	14
16, 17, 18, 19, 20, 21, 22, 23	15

PART I.

COMPRISING THE EASTERLY SECTION OF THE RAILWAY BELT,
INCLUDING THE UPPER COLUMBIA, LOWER COLUMBIA AND
SHUSWAP LAKE DIVISIONS, EXTENDING FROM THE
BOUNDARY OF THE PROVINCE OF ALBERTA TO
THE WESTERN BOUNDARY OF RANGE 15,
WEST 6TH MERIDIAN.

PHOTO-TOPOGRAPHICAL SURVEYS OF THE ROCKY MOUNTAINS.

A. O. Wheeler, D.L.S., 1905.—Castle Mt., Mt. Burgess, Mt. Collie, Peyto Lake, Kewetinok Peak, Cougar Valley, Amiskwi River, Mt. Hurd, Mt. Vaux, Mt. Duchesnay, Porcupine Creek, etc.

SIR,—In 1903 a photo-topographical survey of the Railway Belt through the main range of the Rocky mountains was commenced by the writer at the point where it had been discontinued by J. J. McArthur, D.L.S., and has been carried forward continuously since then.

For the past season work was begun early in June, the party leaving for Castle Mountain station on the Canadian Pacific railway on the 8th of the month.

On the 9th, accompanied by two assistants, a climb was made to the crest of Tunnel Mountain at Banff to obtain the speed of the Camera plates used for the survey.

While in the Vermilion valley during the fall of 1904, the smoke from the forest fires was so dense that a large number of the views were rendered quite useless. It was therefore necessary first to again visit the valley and occupy some additional stations. Four peaks were ascended from June 13 to 20, with a greatest altitude of 8,682 feet above sea-level.

Wet and cloudy weather had now set in and it was found impossible to occupy another station until June 28, when a climb was made to a point on the side of Castle mountain, to supplement inadequate data, due to bad weather the previous season. The altitude of the station is 7,841 feet.

The party next proceeded to Field, B.C., and first made an ascent to a high point of Mount Burgess, to obtain views of the Kicking-horse flats, lost the year before through smoke. Magnificent views were obtained. The altitude of the point is 8,001 feet. A trip was then made into the Yoho valley, and six peaks occupied, the greatest altitude being that of Mount Collie (10,315 feet). One other station, overlooking Peyto lake, was occupied at an altitude of 10,015 feet; a third, Kewetinok peak, at the extreme head of the upper Yoho valley, is 9,512 feet; and the other three are about 8,500 feet above sea-level. This second trip to the Yoho valley was also due to the continued smoke of the year before.

There is no place within the tourist portion of the Rocky mountains where so much of varied mountain scenery is compressed into so small an area as in the Yoho valley. It is difficult to express the wonder of the colour contrasts that meet the eye in the ever-changing panorama of snow-clad peak, rock precipice, dazzling névé, shin-

ing glacier ice and bronze-green forest of pines, midst which nestle magic lakes of changing shades of blue and green.

Work in the Yoho valley occupied until July 18, when a traverse was made of the road from Emerald Lake chalet, one of the Canadian Pacific Railway summer hotels, to Field station at the base of Mount Stephen. The traverse of 7 miles occupied the 20th and 21st days of the month.

A portion of the party was now transferred to Cougar creek, some 5 miles from the summit of Rogers pass in the Selkirk range, and a survey of the newly-discovered caves in the Cougar valley commenced. A description of the valley and the caves will be found below. The balance of the party were employed cutting out a trail up the valley of the Amiskwi river, the one line lying immediately west of the Yoho valley.

On August 9, the party, having returned from the Selkirks, pushed northward up the stream named. The distance from the railway to the Amiskwi pass is about 27 miles. Over part of it a rough trail exists; the balance is through primeval forest. Before reaching the pass, a very striking waterfall, on the east side of the valley, dropping fully 800 feet in a series of beautiful cascades, furnishes a feature that may be classed with the Takakkaw and Twin falls. The name of "Amiskwi falls" is suggested.

Arrived at the summit of the pass, a view of unsurpassed grandeur bursts upon the vision. To the north, across the valley of Blaeberry river, Mount Mummery (11,000 feet) mingles its double snowy peaks with the clouds, while down its sides, pour from every direction a wild confusion of ice cascades, culminating in one grand torrent of ice, broken and seamed throughout by huge crevasses and reaching far down into the valley. Northwestward lies the historic Howse pass of early fur-trading days, and beyond, to the north, rise the giants of the range: Mounts Forbes, Columbia, Bryce, Lyell, Athabaska and Saskatchewan. Here, you are on the farther side of the Wapta snow-field and the north faces of Mounts Habel, Collie and Baker greet the eye. They present sheer rock precipices, rising grandly from the valley below, and between their towers and buttresses pour rivers of ice from the great storage basin of the Wapta snow-field. The valley has wonderful charms of alpine scenery, and excellent fishing, combined with perfect camp grounds, render it a spot well worthy of attention from tourists.

I regret to say that the landscape was again veiled in smoke and, although the party was camped on the pass and at other points along the valley from August 13 to 29, it only succeeded in occupying nine peaks and was unable to finish the work in this locality. Owing to incomplete data, the altitudes are not yet computed.

On September 2, a station was occupied on Mount Hurd at an altitude of 9,265 feet. On September 6, the summit of Mount Vaux was reached; altitude 10,900 feet. On the 11th, two additional stations were completed on Mount Hurd; and on the 12th, a rock cairn was placed on the crest of Mount Duchesnay, at 9,592 feet, and photographs and azimuths taken therefrom. On September 15, stations were occupied on the west side of Porcupine creek, near Leancoil.

During the entire month of September the weather was very broken, and clouds and rain were much in evidence. For this period, when the party was unable to climb, it was employed making a traverse of the railway, and tying in with the peaks occupied, from Leancoil easterly to Ottertail and westerly towards Palliser.

On September 14 and 16, a traverse was made of the road leading from Leancoil station to Ice River valley, and on the 17th and 18th the party moved up to the head of that stream. Camp was located here until October 1, but it was only found possible to occupy three peaks, and the valley will again have to be visited.

Climbing was now closed for the season, as winter had practically set in on the peaks, so the party returned to the railway and spent the intervals of fine weather, until the 27th, in traversing the railway to a point between Palliser and Golden, in taking views at various points along the traverse and in hunting up and tying in section lines with the traverse and cairns set on the several peaks in view from the railway.

On October 28, 30 and 31, a traverse was made of the roads, both old and new, from Laggan station to the Canadian Pacific Railway Company's chalet at Lake Louise; also of the road now in course of construction to Moraine lake. On November 2 the party returned to Calgary, and was paid off.

A. O. Wheeler, D.L.S., 1906.—Amiskwi Valley, Otto Creek, Valley of Otterhead river, Moose Creek Valley, Beaverfoot Range, Kicking Horse Canyon, etc.

SIR,—The party left Calgary for the field of operations on June 10. With one assistant, the writer stopped at Banff to take some views from Sulphur mountain, for the purpose of ascertaining the speed of the plates to be used during the survey; and then returned to Calgary to develop these test plates. The remainder of the party gathered at Laggan, to which point the pack horses and survey outfit had been sent two days before.

PTARMIGAN LAKE COUNTRY.

A short distance northeast from Laggan, on the Canadian Pacific railway, lie some beautiful alpine valleys dotted with small lakes and enclosed by strikingly bold snow-clad peaks. This region, situated chiefly in townships 29 and 30, range 15, west of the 5th meridian, has begun to attract the attention of the tourist; so much so, that in 1905 the railway company put in a well-graded pony trail to accommodate visitors to the mountains staying at Lake Louise chalet. As previous surveys had not embraced this particular locality, a camp was taken near the summit of the watershed between Bow and Red Deer rivers, and later a second camp was established on the head-waters of Red Deer river. In all, ten peaks were climbed in the vicinity and twenty camera stations occupied, furnishing full information for mapping. Work here was closed on July 4.

At this high altitude, the spring had barely set in and snow was still lying plentifully on the passes, and the lakes were clad with ice. It snowed every other day, thereby much retarding the work. The lake near the summit of the pass from the Bow valley, forming one of the extreme sources of Red Deer river, is locally called Ptarmigan lake. It is well named, for round its shores, in all the adjacent valleys and on the alpine slopes above the timber-line, flocks of this most interesting species of the grouse family (*lagopus leucurus*) abound. They are a very valuable feature of the bird life of the Rocky Mountains park, and should be rigourously protected; more particularly the robbing of their nests should be punished. Through the main valleys connecting with the head-waters of Red Deer river are deeply-worn ruts made years ago by large herds of buffalo passing to and from Bow, Red Deer and Saskatchewan rivers, showing that these sheltered valleys were their favourite wintering grounds.

Two exceptionally fine peaks, mounts Douglas and Drummond, named after noted naturalists, rear their massive forms on opposite sides of Red Deer river. In their vicinity are a number of most charmingly picturesque lakes. The larger valleys of the district present rolling park lands and open pine woods, and furnish a paradise for botanists and those desiring to camp amidst beautiful mountain scenery. As a tourist resort, the locality may be recorded as one of the most attractive of the entire Rocky Mountains park.

ALPINE CLUB OF CANADA.

In March of the current year the Alpine Club of Canada was organized at Winnipeg. It was based upon the principle that it should be a national institution and that its first object should be to interest the people of Canada in their own mountain regions. To this end, it was decided to hold a first annual camp at the summit of Yoho pass, in the Yoho National park, from the 9th to the 16th of July, with accommodation for one hundred persons.

At this early stage of the club such an undertaking would have been impossible but for assistance rendered from three special sources, viz.: From the Dominion Government by contributing the services of the writer's survey party, from the Government of Alberta and private persons by money contributions, and from a number of the mountain outfitters, who contributed men, horses and outfits, free of charge, to make this first camp a success. And a success it was. One hundred and twelve persons were present, among whom were representatives from England, the United States and South Africa, and from numerous points throughout the length and breadth of Canada. No spot in the entire system of Canada's mountain splendours could have been found where more diverse and representative features are presented, and the immediate result of that camp has been to bring the club's membership, within its first year, up to one hundred and sixty-five, with an enthusiastic demand for a repetition of the camp for next year, when the attendance promises to be much larger.

The survey party was engaged with this camp until July 18.

AMISKWI VALLEY AND OTTO CREEK.

To the west of the President's range lies the valley of Amiskwi river leading over a watershed, shown on a previous explorer's map as "Baker pass," to Blaeberry river, and thus to the head-waters of the Saskatchewan, via the old Howse pass. About half-way between Kicking Horse river, into which the Amiskwi flows, and Baker pass, a tributary enters the latter stream from the northwest. By following the tributary to its source a pass is arrived at which likewise leads to Blaeberry river. They have been named, respectively, Otto creek and Otto pass.

This depression cuts into the eastern edge of Van Horne range on a course parallel to its direction, and from July 20 until August 2, the party was engaged in gathering such topographical information as could be reached from it. Seven peaks were climbed and thirteen camera stations occupied. Two additional climbs were made in the Amiskwi valley and four camera stations occupied to supplement information obtained the previous season, but found inadequate owing to smoke from bush fires. During the dates above mentioned frequent showers occurred and some hail and snow fell, but not sufficient to interfere materially with the work. Both the Amiskwi and Otto Creek valleys are densely timbered. Much of the timber, chiefly spruce, is of merchantable value and lies within the timber limits of the Palliser Mills Company.

VALLEY OF OTTERHEAD RIVER.

Van Horne range was next entered by way of Otterhead river. An old lumber road extends for about 2 miles up the stream, but from that point on, a pony trail had to be cut out clear to the head of the valley, a distance of about 9 miles through thick timber. About half-way the stream forks, a tributary coming in from the northeast. The westerly or main stream was followed to the pass at the head of the valley, which leads across a glacier to a valley discharging its waters into Blaeberry river. On the west side of the pass stands a flat rock mass, which, seen from the direction of the valley, has a very striking appearance, rising into the air like a huge spike. Directly to the south of it an easy pass gives access to a large valley with many tributaries, all sending glacier fed torrents to feed Glenogle creek, which joins Kicking Horse river near Glenogle station on the railway.

The work was carried for some distance down on the Blaeberry side of the pass, and also into the Glenogle Creek valley as far as it was possible to extend it. On the 20th the ascent of mount Deville was commenced, but a heavy fall of snow forced a return, and as this early snowfall entirely changed the character of the landscape for several days, the party was compelled to move on.

Altogether, between the 5th and 21st August, nine peaks were ascended and sixteen camera stations occupied. Throughout this period of the work, smoke from bush fires was a highly detrimental factor. The valley is in parts heavily timbered with good merchantable spruce, but is understood to be already under license.

MOOSE CREEK VALLEY.

Work was now transferred to the south side of Kicking Horse river, and a move made up the Beaverfoot as far as Ice river. A peak was climbed close to the Shining Beauty mine on the north side of the latter, and two camera stations occupied. The Shining Beauty has been working steadily all summer. It employs about thirty men. The ore—silver, copper and zinc, with a trace of gold—yields about \$49 to the ton. About thirty-five tons of supplies have been packed in for winter consumption, and it is understood that the company owning it are about to put in an up-to-date concentrator.

Dense smoke on August 26 rendered photographing impossible, and compelled the party to move on up the Beaverfoot valley to Moose creek.

Moose creek, as it is locally called, is in fact the actual source of Beaverfoot river. Utilizing the smoky weather for travelling, the party went direct to the head of the valley by means of a trail leading to a mine now being operated by the Shining Beauty Company. Rain on the 27th and 28th cleared the atmosphere, and on the 29th and 30th climbs were made of mount Sharp and Helmet mount, both peaks being situated at the head of Moose creek.

On September 3, a climb was made of Zinc mountain. On the east slopes of this mass the mine above referred to is situated. A tunnel has been pushed in more than 200 feet and some excellent ore taken out—zinc, silver and copper—but no work is now being done except the yearly development necessary to hold it. On the 4th, stations were occupied along the north edge of the Washmawapta glacier, giving data to map the glacier and also overlooking the head of the Ottertail valley and Ochre creek, tributary to Vermilion river. From the 5th to the 9th it rained incessantly, and no work could be done.

Two other stations were occupied in connection with this tract of country. In all, nine peaks were climbed and eight camera stations occupied.

Moose creek is remarkable for the large flocks of wild goat seen on the steep slopes of mounts Sharp and Helmet and around the moraines of the Washmawapta glacier.

BEAVERFOOT RANGE.

On September 13, the party proceeded up the Beaverfoot valley and, crossing the watershed, camped on the head-waters of Kootenay river. From now on, until October 2, the energies of the party were concentrated upon obtaining data to map the Beaverfoot valley and inclosing ranges, and to obtain as much data as could be got from summits along the Beaverfoot range.

The Beaverfoot valley is 6 to 8 miles wide and densely timbered. On the east side a good pony trail leads up Beaverfoot and down Kootenay river to Windermere and Steele. On the west a wagon road connects Palliser station on the Canadian Pacific railway with the Palliser Mill Company's camp, about 10 miles up the river. Down the centre of the valley, on the Kootenay side of the watershed, open meadows dotted with ponds extend for about 8 miles. These facilities were used to move the camp, but in the case of every ascent made on either side, it was necessary to cut out from 3 to 4 miles of trail through dense woods to attain a point from which a summit could be reached. From the crests of the Beaverfoot range splendid views were obtained of the broad Columbia valley, glistening in every direction as the sun shone on winding river and innumerable ponds and channels covering the valley bottom in a network; beyond, lay the serried, snow-clad array of the Spillimacheen mountains. To cover this section, eight peaks were ascended and thirteen camera stations occupied.

All the good timber tributary to Beaverfoot river is under license to the Palliser Mill Company. A tract has been burned along the northeast slopes of the Beaverfoot range, but south of the meadows previously referred to, large tracts are found on both sides of the Kootenay valley that are still intact and would be of great merchantable

value if there were a waterway of sufficient volume to carry the logs. The timber is chiefly spruce and Douglas fir, with a considerable quantity of pine, particularly on the northeast side of the valley.

Game is very abundant, moose and smaller deer being found in the woods surrounding the meadows referred to, where there are a number of salt-licks, and goats on all the peaks above timber-line. The crests and long ridges of the Beaverfoot range seem to be a favourite spot for goats. They were seen here in every direction in flocks, sunning themselves, and were so tame and would come so close that they could be hit by tossing a pebble. Grouse of two kinds are very plentiful in the woods and ptarmigan on the slopes above timber. Indications of a few beaver were seen around the meadows near the watershed and in Ice river valley, but they are few, and it will only be by careful protection that they will be saved from extinction.

KICKING HORSE CANYON.

Between the 6th and 15th October four ascents were made along the lower canyon of Kicking Horse river and eight camera stations occupied. The weather during this period was broken, and the winter snows gradually collected on the summits, so the traverse of the railway line was picked up at Glenogle, where it had been discontinued the previous year, and on days when climbing was out of the question it was carried forward westerly to Golden.

TRAVERSE OF THE RAILWAY.

From the 16th to the end of October a careful traverse of the railway was carried from Golden to Donald and ties made with established survey corners, the main camp having been moved to Moberly for this purpose. Camp was broken up on November 1, and the party returned to Calgary.

STATISTICS OF THE SEASON'S SURVEY.

The season was an exceptionally fine one, the field work extending over 154 days. Of these, forty-eight days were spent in preparing for the survey, moving camp, rest on Sundays and storing outfit; sixteen days were lost through bad weather, rain or snow; six were lost through smoke from bush fires; and the remainder, eighty-four days, were spent upon the actual work of the survey.

Altogether forty-seven ascents were made and eighty-nine camera stations occupied, from which 471 plates were exposed. At each camera station a round of photographs were taken and azimuths to obtain orient points for the views. To reach the peaks with instruments, 24 miles of trail had to be cut through thick timber. Along the railway, 25 miles of traverse were made between Glenogle and Donald, each course being chained twice to ensure accuracy.

Three kinds of plates were used, viz: Seed's non-halation L. Ortho, Lumière non-halation A orthochromatic and Cramer's slow isochromatic. The Seed plate has a unit of exposure of five seconds with the orange screen used, the Lumière ten seconds and the Cramer fifteen seconds. The Lumière plates give the best results.

PROGRESS OF THE WORK.

The topographical survey of the main range of the Rocky mountains has now been completed westerly as far as Columbia river at Golden. It extends, generally speaking, 20 miles on either side of the railway, being bounded on the north by parallel $51^{\circ} 31'$ N. latitude, by the Pipestone and Bow passes and by Blaeberry river; and on the south by parallel 51° N. latitude, by the summit of the range and by the south boundary of the Railway Belt. In order, however, to connect with the survey of the Selkirk range, from Beavermouth to Revelstoke it is still necessary to make a survey of the Spillimacheen mountains and the Dog-Tooth range, lying between Columbia and Beaver rivers south of the railway. There also remains a portion north

of the railway between Blaeberry and Columbia rivers. The Spillimacheen mountains are of considerable importance, owing to mining interests held in their midst, and there is a growing demand for maps of that region. It is proposed to fill in the gaps outlined by another season's work.

The map work of the mountain territory surveyed is now being pushed forward as rapidly as possible. The tremendous influx of tourists, hunters and those engaged in scientific research has caused the railway company to add yearly to its mountain hotels until what were formerly small chalets are now magnificent edifices offering the most refined comforts of civilization. This influx, to which a very considerable zest has been added by the formation of the Alpine Club of Canada, means an ever-increasing revenue to Alberta and British Columbia through catering to the wants of these people. There is a constant demand for accurate maps. While it is impossible to complete a map of the whole until the field work is completed, this office has been endeavouring to put out advance sheets of the parts most required by tourists, and will, during the coming winter, get ready an advance topographical sheet of Yoho park with that object in view.

A. O. Wheeler, D.L.S., 1907.—Dogtooth Mts., Beaverfoot Range, Spillimacheen, Blaeberry, Bluewater, etc.

SIR,—I have the honour to submit the following report on the past season's operations:—

Work in the field was commenced on June 21, and a party sent to Paradise valley, near lake Louise, where it was required to obtain some missing photographic data. Here also the party, under instructions from the deputy minister, assisted the Alpine Club of Canada in the organization and effectiveness of its second annual camp. Without such assistance the camp would have been impossible, for there are as yet few trained mountaineers in Canada, and the members of my climbing parties acted as guides upon this occasion. These, through long experience, are the equals and in some respects the superiors of Swiss guides.

A word concerning the Alpine Club may not be amiss. It was organized on March 27, 1906, with a membership of 79, which has in less than two years increased to over 300. Members are scattered through the length and breadth of Canada, from Halifax to Vancouver. The membership is not confined to Canada, but extends to Australia, South Africa, France, England, Ireland and the United States of America, where it has representatives in ten states of the union. Three members of the Alpine Club of England, the oldest and most exclusive of all the Alpine clubs of the world, and three Fellows of the Royal Geographical Society, are among the Canadian club's members.

The result of the organization is the springing up of a most enthusiastic appreciation of Canada's mountain regions by Canadians, especially noticeable during the past summer, when more real mountaineering was done in the Canadian Rockies than for three years previous, not only by our own people but by people from other countries.

The value of the club was immediately recognized by the Canadian Pacific Railway company, and this powerful corporation has given it all possible assistance since its inception, quickly foreseeing that the thousands of which its membership will ultimately consist will be the best possible medium for converting the splendid Alpine tracts of Canada into a revenue producing centre, such as the European Alps, from the inflow of tourists.

On July 15 the survey party was sent to Golden, B.C., in charge of M. P. Bridge-land, D.L.S., my chief assistant, and climbing and photography for mapping purposes was immediately begun.

Accompanied by two assistants and a packer I made a flying trip up the Yoho valley to the Yoho glacier, where metal plates had been set out the previous year

for the purpose of ascertaining the rate of movement of the great ice tongue here outflowing from the Wapta ice field. Too little attention has been bestowed upon this branch of science by the government surveyors in the mountains, and, though possessing the best opportunities owing to the vast areas of ice and snow distributed along the higher portions of the several mountain ranges, most of the observations made so far have been by scientists from other countries.

Having checked the movements of the plates for the year, and made a quick photographic survey of the icefall and surrounding valley, I proceeded to Golden and, organizing two parties, crossed Columbia river. One party under Mr. Bridgeland was put to work in the Dogtooth mountains on the headwaters of Grizzly and Quartz creeks. With the other I carried the work southward along the west side of Columbia river.

On August 25 Mr. Bridgeland's party recrossed Columbia river and commenced a survey of the Beaverfoot range southward along Columbia river valley. At the same time I pushed into the Spillimacheen mountains with the intention of paralleling the work of the party on the east side of the Columbia.

Much delay and hindrance was caused to the work by the exceptionally stormy wet weather encountered during the months of August and September. It was intended that Mr. Bridgeland's party should work southward to the junction of Kootenay and Columbia rivers, but it was found impossible to get farther than thirty miles from Golden.

On the other side of the Columbia the dense forests extending many miles back from the stream forced us to keep to the heads of the tributary streams and to work from these sources to the peaks overlooking the valley of the main waterway.

Between the north and south branches of Spillimacheen river and southward therefrom lies a magnificent tract of truly Alpine country, with wide icefields reaching in every direction, from which rise sharp peaks, snow-clad domes and rocky precipices in the wildest confusion, many of the peaks attaining an altitude of little less than 11,000 feet above sea level. Icefalls are everywhere, and waterfalls leap from sheer heights many hundreds of feet to the beautiful Alpine valleys below. This tract is practically unknown and unmapped; the peaks are unnamed, and, except in so far as it has been visited by the mining prospector, it is a new region and yet remains to be explored. It is the home of the caribou and wild goat, and would furnish a paradise for the tourist and lover of nature if properly brought to notice. Moreover, Columbia river as a navigable waterway, and pony trails made by prospectors up the main valleys to numerous mining prospects, render it comparatively easy of access.

On September 19, owing to the continued wet weather, and the necessity of doing some work up Blaeberry river, and along the Columbia below Golden, I crossed the river and called in Mr. Bridgeland's party. This party was now sent up the Blaeberry to obtain sufficient data to enable the work carried northward from Kicking Horse valley to be mapped along the Blaeberry.

With my own party, I made a flying trip up Bluewater river and occupied several peaks in that vicinity. I then, with Donald as a base, occupied three of the outlying peaks of Dogtooth range as far as Quartz creek near Beaver mouth, thus completing the work which Mr. Bridgeland had been unable to finish owing to bad weather.

The last two weeks of October were occupied by Mr. Bridgeland's party in making a traverse up Blaeberry river to tie in the camera stations he had previously occupied. With my own party I made a traverse along the railway from Donald to Beaver mouth, using the railway as a base to tie in the camera stations occupied on both sides of the Columbia valley.

October was an exceptionally fine month, and good work was accomplished, thus saving an otherwise disastrous season. The survey was closed upon that previously made of the Selkirk range, and information is now at hand to furnish topographical

maps of the mountain area lying along both sides of the Canadian Pacific railway between The Gap at the eastern escarpment and Revelstoke at the second crossing occupied. This belt of topographically surveyed country extends largely to the limits of the railway belt.

During the season forty peaks were climbed and seventy-seven camera stations occupied thereon. In addition twenty-four camera stations were occupied along the railway at various points of vantage. Four hundred and thirty-one plates were exposed and data completed to enable the mapping of more than one thousand square miles of mountain country, which work will be performed during the coming winter and spring.

TRIANGULATION SURVEYS IN THE RAILWAY BELT OF BRITISH COLUMBIA, UPPER AND LOWER COLUMBIA.

P. A. Carson, D.L.S., 1906.—Storm Mt., Amiskwi, Mt. King, Blaeberry, Beaverfoot, Spillimacheen, North Fork, Beavermouth, Mt. Bonney, Illecillewatt, Albert, etc.

SIR,—I have the honour to submit to you the following report of my field operations on the triangulation in British Columbia in connection with the trigonometrical section of the Topographical Survey of Canada, for the season of 1906, with an accompanying map.

I will quote, sir, from your letter dated the 4th day of July, 1906, "A surveyor should devote the greatest care to the preparation of his annual report, that being the only thing which Parliament and the public have before them to form an opinion of the surveyor's efficiency." It would seem, therefore, that the object of a surveyor's annual report is not so much to give to the department an exhaustive technical treatise on the surveyor's field operations as to present to the public at large a clear account of the work performed, and to impart such knowledge and information as the surveyor has gleaned while in the field.

How often during the past season was I asked by tourist, merchant, farmer, prospector, by every one I met, that perpetual question: "What is your survey for?" To the average person the need of ordinary surveys for the subdivision of agricultural lands, or defining mineral claims, is at once apparent. But a triangulation survey of the mountains, well, to almost all, the necessity and object of such a survey are incomprehensible.

I would say, therefore, by way of explanation, that the object of this triangulation survey is a purely practical one, viz.: of providing by a system of triangulation a number of permanent reference marks available for the extension, over adjacent areas, of surveys of all kinds—the subdivision of agricultural lands, defining the limits and boundaries of the Railway Belt, mineral claims, timber limits, etc.—which are so necessary to the development and administration of all new countries. On account of the mountainous nature of that vast tract of country lying in the embrace of the Rocky and Selkirk mountains, the surveys of British Columbia are necessarily of an isolated nature, in contrast with the gigantic system of surveys so admirably developed and extended in the comparatively level provinces of Western Canada. The huge framework of the system could not be extended through the mountains, where it was impossible to run base lines. Consequently, to perform required surveys in isolated valleys it was often necessary to run slender and unreliable traverses over many weary and expensive miles. Such a method was of course objectionable, and the difficulty was solved by a triangulation survey which establishes convenient permanent reference points for commencing all kinds of new surveys.

and besides forms a bond connecting the main system of Dominion surveys with its outlying parts, making the whole depend upon the same astronomic and geodetic data, and securing a uniformity and consistency for the entire system not otherwise obtainable.

The method of performing such a triangulation survey is as follows: With the assistance of all existing maps and other information of the country to be embraced by the survey, a system of triangles is projected. The shape of the triangles is dependent only on the rule that no angle of a triangle should be greater than 120° or less than 30° ; the length of the sides of the triangles varies according to the nature of the country, the precision required and the objects to be gained. In this survey the sides of the triangles are from 15 to 20 miles in length. A reconnaissance party visits the projected stations and decides upon their suitability or chooses other nearby stations in their stead. In this the surveyor in charge of the reconnaissance is guided by many circumstances and conditions, such as: the existence of trails or other feasible routes by which the stations may be reached, the accessibility of the summits, the permanence and suitability of the peaks (an ice capped peak will not answer), the prominence of the neighbouring peaks and ranges, the intervisibility of the different stations, and so on; and upon his success in fixing these stations largely depends the ultimate success of the triangulation.

When the stations have been fixed and signals erected, horizontal angles are carefully observed at each station. A base line is also located and accurately measured; then by gradually increasing triangles it is projected and extended to the main system. At certain stations astronomical observations for azimuth are taken, and the latitude and longitude also determined. By means of these data, viz., the linear measurements of the base line, the angular measurements of the triangles carefully weighed and adjusted, and the determination of azimuth, latitude and longitude, there are then calculated the relative positions of all the triangulation stations and other secondary reference points.

From observed and corrected vertical angles at the different stations may be determined the altitudes above sea-level of all stations, mountain peaks, and other reference points, using certain known altitudes, such as the rail-levels of the Canadian Pacific railway, as media of reference. Altitudes so calculated are more accurate than those obtained from unreliable and limited aneroid readings.

Each triangulation station on the summit or peak of a mountain is marked in a permanent manner. The permanent mark adopted for this survey consists of a brass bolt six inches long and three-quarters of an inch in diameter, with a flat square head one and one-half inches square and one-half inch thick. This bolt is set in a hole drilled in the rock and firmly fixed by cement. The head of the bolt is stamped with the number of the station in Roman numerals followed by the Greek letter Δ , or triangle; the apex of the triangle faces the north at the centre of the head of the bolt, and is the geodetic point. Besides its number, the station is generally given a name, such as the local name of the peak or range on which the station is situated.

As reference points for accurately determining the position of the permanent mark at any future time, are placed four separate iron bolts, set in holes drilled in the rock and fixed with cement. The bolts are each 6 feet distant from the geodetic point, and bear respectively north, south, east and west from it. This method of placing reference marks was followed as closely as circumstances would permit, and a detailed description of each station was taken and recorded.

Signals for observing upon from other stations were erected as follows: With the geodetic point exactly at the centre of its base, a conical stone cairn was built, measuring from 6 to 8 feet in diameter at the base, 2 feet in diameter at the top, and from 6 to 10 feet high. Surmounting the cairn was placed a truncated cone of tin, two feet in diameter at the base, one foot at the top and two feet high. The top of the signal in each case is vertically above the geodetic point. The individual measurements of each signal were taken and recorded.

The triangulation of the Rocky mountains in the vicinity of the main line of the Canadian Pacific railway, and its extension westward within the Railway Belt, British Columbia, was commenced by Mr. W. S. Drewry, D.L.S., who began operations in the spring of 1889, and carried on the work for four successive seasons. During this time signals were set and angles observed at eighteen stations of a primary system of simple triangles, extending from the fifth initial meridian westward to Mount King, in township 27, range 19, west of the 5th meridian. The tract embraced by this network is some 110 miles in length and has an average breadth of 20 miles. For this triangulation a base line about one and one-half miles in length was measured near Cochrane, Alta., and extended to the main triangulation. Mr. Drewry also established signals westward into the Selkirk range, but here the simple system of triangulation was enlarged, and a double chain of triangles carried across. Eight signals in all were placed, crossing the summit of the Selkirks and reaching as far westward as Twin Butte, 10 miles east of Revelstoke. No angles, however, were observed west of Mount King, and at none of the stations were permanent marks placed.

In the spring of 1893, Mr. Drewry began work on the Alaskan boundary for the British Columbia Government, and about the same time a decreasing demand for lands within the Railway Belt, as well as in the whole of Western Canada, resulted in an almost stagnant condition of Dominion surveys for several years, and of course a corresponding decrease in the Government Survey appropriation. The triangulation survey of the Rocky mountains was consequently discontinued, and remained in abeyance until the renewed activities of the past few years in mining and lumbering operations, and an influx of settlers in the many fertile agricultural and fruit growing valleys of British Columbia showed the necessity of recommencing the triangulation.

My instructions, dated June 2, 1906, read: "You are to take up the work where it was left by Mr. Drewry, in 1892, as shown on the accompanying diagram, and to extend it westward. The main object of your work during the present season will be to establish permanent marks at the stations which are to be occupied, to erect signals for observing angles next season, and to select a place for measuring a base line. The latter should not be less than 5 miles." I left Ottawa on June 5 for Calgary, where I outfitted for the field.

STATION XIV (STORM MOUNT).

Storm mountain, on whose summit station xiv is situated, was the first station visited, being on the western limit of the completed portion of the triangulation. It is a high mountain (altitude 10,300 feet) at the summit of the Rockies, on the boundary between the provinces of Alberta and British Columbia. The mountain lies in the southerly portion of township 26, range 15, west of the 5th meridian, and is visible from Castle Mountain railway station, being about 6 miles distant therefrom in a southwesterly direction. To reach Storm mountain we camped at Castle Mountain railway station, 16 miles west of Banff, on the left bank of Bow river. There is a good camping ground with excellent pasturage for horses on the small flat between the railway and Castle mountain. By following the old tote road westerly up Bow river for nearly 2 miles, we discovered an easy ford over the river, which at this date, June 19, was still very low, owing to recent cool weather. The Vermilion trail was connected with at the ford, being about half a mile west of the mouth of Vermilion creek. The trail keeps to high ground on the west side of the creek and was in fairly good condition. There are several small lakes along Vermilion creek, in one of which we made some fine catches of large Dolly Varden trout. Some good timber still exists along the trail, although a great deal has been cut for railway ties. The trail follows the south fork of Vermilion creek to Vermilion pass, a distance of about 8 miles from the railway. There are many westerners who still maintain that Vermilion pass offers a better, though longer route for a railway (via Castle mountain, Vermilion pass, Vermilion, Kootenay and Beaverfoot rivers) than the present line of the Canadian Pacific railway over Big Hill or Kicking Horse pass. The

altitude of Castle Mountain station is 4,660 feet, and that of the summit of Vermilion pass about 5,300 feet, or a difference in elevation of 647 feet in over 7 miles. The grade on the western slope would be even less. The pass is fairly wide, with no danger of rock or snowslides.

About half a mile south of the pass, the trail crosses a small stream forming the head-waters of Vermilion river, flowing southerly. Here we pitched camp with Storm mountain lying to the east. The ascent of Storm mountain was made up its south slope. We descended along Vermilion river by trail for one and a half miles to the mouth of a small mountain stream flowing from the south base of Storm mountain. We ascended the small valley of this creek, guided by an old blazed trail, till we reached timber-line at the head of the stream. Then attacking the steep snow-covered south slope of the mountain we attained the broad summit of Storm mountain after a climb of five and a half hours. I will not attempt to describe the magnificent panorama which may be seen from this mountain, the ever-changing lights and shadows rising and falling on the frowning peaks of rock and the cold bare fields of eternal snow, extending in every direction to the blue horizon. The summit of Storm mountain was covered with 3 feet of snow, and on the eastern ledge of the peak a huge snow cornice 10 feet high hung over the precipice. Drewry's cairn, a silent monument to the sometime presence of man, was in good condition after its fifteen years of solitary vigil. The cairn was covered with snow and the rocks were frost bound, but after considerable prying we managed to reach the bottom of the monument. In a hole drilled in the rock at the true centre of the base of the old cairn was placed a brass bolt (for description see above) fixed in cement. The head of the bolt was stamped with the number of the station in Roman numerals, followed by a triangle with its apex at the centre of the head of the marker. The apex of the triangle is the geodetic point. As reference marks were set four separate iron spikes in the rock and fixed with cement. Each reference mark is 6 feet from the geodetic point, and they bear respectively north, south, east and west from it.

Over the permanent mark the conical stone cairn was rebuilt in the same position as before. The cairn measures 8 feet in diameter at the base, 2 feet at the top, and is 8 feet high. Surmounting the cairn a truncated cone of tin was placed. It was filled with stones and securely wired to the cairn. The top of the tin signal is 10 feet vertically above the geodetic point.

The day of the ascent, June 23, was a clear summer day, and during our five hours' stay on the summit our heads were hot and perspiring with the heat of the sun, while our feet were numb with cold. The thermometer registered 72° F. on the summit at 2.30 p.m. The descent to camp was made in two hours and forty-five minutes by a series of rapid glissades and hurried scrambles over scree and shale. The day after our climb we were attacked with snow blindness, having neglected to take snow glass with us up the mountain, and the bright and sparkling sun wrought havoc with our eyes. Our faces too were frightfully sunburnt.

There is very little grass for horses in the vicinity of Vermilion pass, although our horses managed to find some pickings along the trail. Game is somewhat scarce, too, in this district, although we saw traces of bear, deer and marten. The trout fishing is excellent, rainbow or cut-throat trout (*Salmo mykiss*) and Dolly Varden trout (*Salvelinus malma*) being plentiful in the small lakes and streams, although the fish are such gluttons that to a true angler their capture seems like slaughter.

STATION XVIII.

From Castle mountain the horses were sent to Field, B.C., via the old Canadian Pacific Railway tote road over the summit of Kicking Horse pass. The road is in very bad shape, but the trip was made without difficulty. The rest of the outfit was shipped by rail.

To locate station xviii, Mr. Drewry travelled up Amiskwi river which flows into the Kicking Horse just below Emerald river, and in making the ascent of the mountain whereon he set the signal, he had, according to his report, "a hard, rather dangerous

climb." I learned at Field that the trail up the Amiskwi had not been used for some time, and that station xviii (under which name, by the way, the mountain is locally known) could be much more easily reached via the Yoho valley. Following this advice, we travelled to Emerald lake by an excellent wagon road, a distance of 7 miles. Then we followed a well-cut trail along the north side of that beautiful lake leading up and over the Yoho pass to Yoho lake (or Summit lake) where the Canadian Alpine Club held its first annual camp this summer. We then followed the upper trail northerly up the Yoho, the trail being cut along the steep sides of Mount Vice-President and Michael peak almost at timber-line. From the high elevation of this trail may be seen some of the grandest scenery in the Rockies, Takakkaw falls, Daly glacier, Mount Daly, Mount Balfour, and the beautiful Yoho valley. Skirting lake Duchesnay the trail strikes a tributary of Yoho river, and a branch trail turns to the left, and ascends Little Yoho river, passing the broad form of Whaleback mountain, the Habel glacier—with the Isolated peak rising from the ice and snow—and reaches almost to Kiwetinok pass. We pitched camp at an altitude of 6,000 feet, beside the Little Yoho, a small mountain brook some 15 feet wide, with station xviii bearing northwest about two miles. There is a little grass in the valley of the Little Yoho, but in making this trip it is wise to camp at Emerald lake as there is no horse pasturage at Yoho lake or along the upper trail.

The ascent to station xviii was an easy one, with very little green timber or brush to retard progress, on account of the high elevation of our camp. Most of the trip was a steady ascent up huge snow-fields, and the summit was reached in three and one-half hours. The whole mountain was covered with deep snow, and a cornice rose on the easterly ledge of the peak to a height of 12 feet. A strong and bitterly cold wind blew all day, and during our enforced stay on the summit we suffered horribly from cold, although the thermometer really registered only 20° below freezing point. The wind so shook the transit, too, that good instrumental work was impossible.

The view from station xviii is a grand one, especially over the enormous fields of ice and snow which extend far away to the north and east, the Wapta glacier and névé, the Habel glacier, and the Waputik snowfield, and forever guarding the white landscape are the cold stern gendarmes, Mummery, Habel, Collie, Baker, Gordon and Balfour. To the south are the clustered peaks of Kerr, Marpole, President, Vice-President and Michael. In the southwest stretches the thin red line of the Van Horne range; and to the west, the dark green valleys and passes near the Blaeberry, stretching northerly to Howse pass.

On the summit of the mountains we found Drewry's cairn in good condition, and at the centre of its base we set the brass permanent mark in a hole drilled in the rock, fixing it firmly with cement. The head of the brassmarker was stamped with the number of the station in Roman numerals, followed by a triangle with its apex at the centre of the square head of the bolt. The apex of the triangle is the geodetic point. Two reference points were placed, being iron bolts, each set in holes drilled in the rock, and fixed with cement. One reference bolt is due south of the geodetic point and is 7 feet from it. The other reference bolt is due west of the geodetic point, and is 6 feet 6 inches from it. No other reference marks were placed owing to the deep snow on the north and east sides.

Over the permanent mark the conical stone cairn was rebuilt in exactly the same position as before. Its dimensions are: Seven feet in diameter at the base, 2 feet at the top and 7 feet high. Surrounding the cairn a tin signal was placed as at station xiv. The top of the signal is 9 feet vertically above the geodetic point.

We returned to Field as we came, having been absent six days, during which time we had three days' rain with several inches of snow on the third day.

STATION XVII (MOUNT KING).

Station xvii is situated on the summit of Mount King at the southerly end of Van Horne range. This range of mountains extends from Kicking Horse river near Ottertail in a northwesterly direction to the Blaeberry, and the red colour of the rock makes

the range easily distinguishable from a distance. The station lies in the northwest quarter of section 29, township 27, range 19, west of the 5th meridian, and is distant about 4 miles in a northwest direction from Ottertail railway station.

The mountain is reached from Field by following the Ottertail wagon road down the south side of Kicking Horse river for three or three and one-half miles; then, near the railway siding of Emerald, and about 300 yards east of a log house by the side of the wagon road, a trail turns off down into the Kicking Horse flats. This trail follows the river for about 3 miles when the stream may be easily forded. The trail then leads to some old logging shacks on Otterhead river. Another set of loggers' cabins is situated a mile and a half above the first group, and camp should be pitched midway between the two logging camps. There is plenty of grass for horses along the low flats near the mouth of Otterhead river. Some of the timber along this stream has been logged and run to Palliser, but there still remain good limits of spruce, fir and cedar, although nearly all the timber is under license. Moose, deer and bear are plentiful in this vicinity, and a few goat on the mountain.

Mount King is not an easy mountain to approach, as the timber at the base and on the lower slopes is full of windfall. The climb is made easier by following some of the loggers' trails which ascend for a short distance up the lower slopes. The best ascent from the east side is up the bed of a stream which flows into the Otterhead midway between the two groups of logging cabins. The best route then is to follow this draw to its basin, cross over a shoulder to the north, and descend into the basin of the largest creek (called locally Bear creek) which flows from Mount King into the Otterhead. This basin is the objective point, but the ascent should not be assayed up Bear creek on account of the heavy growth of alder and brush lining that stream. Much arduous toil is saved by commencing the ascent at the proper point. On gaining the basin of Bear creek the remainder of the trip is up a steep arête, which makes an interesting climb. We made the ascent from our camp on the Otterhead in seven hours and a half, taking things easy all the way.

We found Drewry's cairn on the summit, which is about 50 feet long east and west, but only a narrow ledge of rock north and south, with a sheer drop of five hundred feet on the north side. The cairn was razed, and at the true centre of its base a brass marker was set in the solid rock and fixed with cement. The flat top of the marker was stamped with the number of that station xvii in Roman numerals, followed by a triangle with its apex at the centre of the head of the marker. The apex of the triangle is the geodetic point. As reference marks three iron bolts were placed in holes drilled in the rock, and fixed with cement. Each bolt is 6 feet distant from the geodetic point, and they bear respectively south, east and west from it.

Over the permanent mark the conical stone cairn was rebuilt in the same position as before. It measures 7 feet in diameter at the base, 2 feet at the top, and is 6 feet 6 inches high. Surmounting the cairn a tin signal was placed. The top of the signal is 8 feet 6 inches vertically above the geodetic point.

The ascent was made on July 4, and the day was bright and warm, with little or no wind. The thermometer registered 75° F. on the summit at 3 p.m. The peak was covered with a lot of snow, and a huge cornice hung over the northerly ledge. The descent was made in four hours, after a very disagreeable trip down the alder-tangled bed of Bear creek.

STATION XIX (BLAEBERRY).

We next moved to Golden, a small lumber town lying in the Columbia valley at the mouth of Kicking Horse river, and then descended the Columbia valley about 8 miles by wagon road to the flag station of Moberly.

Just west of Moberly siding there is a tract of land some 800 acres in extent, lying between the railway and Columbia river, part of which is muskeg and part good hay land, but mostly inundated at high water during July and August, and the greater portion of September. An optimistic outsider has purchased this land, and intends

to attempt some extensive dyking and draining, although the neighbouring ranchers between Golden and Moberly cast doubt upon the feasibility of the scheme; they claim that it is impossible to drain off the abnormal seepage from the mountains, as most of the land is lower than the bed of the Columbia. The enterprise should be watched with great interest, for on its success depends to a large degree the redemption of the extensive bottom-lands along the Columbia river.

There are several prosperous ranchers between Golden and the Blaeberry, and excellent timber on the west side of the Columbia, some of which is being logged and run down to a saw-mill at Beavermouth. There is a good site for a saw-mill at the mouth of Blaeberry river, and the timber up that river is unexcelled in quality, fir, cedar and spruce growing thick, straight and sound, and of a convenient size for logging and driving. Most of the timber is on the east side of the river, that on the west side for a dozen miles being mostly burnt. The Blaeberry is a grand game district, moose, caribou, deer, bear and goat being plentiful, and at no distance from the railway.

Blaeberry river is a rapid glacial stream heading at the Howse pass. It has an average width of 40 feet, and a depth of 3 feet, and runs nearly 8 miles per hour. The valley is from half a mile to a mile in width, and in some places the river runs through gravel flats, although at about 9 miles from the railway it emerges from a narrow canyon which extends for 6 or 7 miles up the river. There is very little grass for pasturage after leaving the Columbia valley until this canyon is passed.

A good pack trail follows the east side of the Blaeberry from the Columbia, commencing just east of the Blaeberry railway bridge, although about half a mile west of Moberly, and a mile and a half east of the mouth of the Blaeberry, a trail turns off the old tote road and joins the main Blaeberry trail about 3 miles up the river. The mountain on which Mr. Drewry placed his cairn is on the west side of the river, and by the use of field-glasses the stone monument is visible from the trail. We ascended the Blaeberry about 6 miles, forded the stream at some shingle flats, and followed the west side of the river for about two miles and a half, cutting trail as we went. The ascent to the Blaeberry cairn was made via the southern slope of the mountain, up a wooded ridge covered with brulé and windfall, which made the trip to the timber-line very fatiguing. Above the limit of vegetation the ascent was quite easy, and the broad summit of the mountain was gained after a six-hour climb.

Station xix (Blaeberry) was marked with the usual brass marker, set flush in the rock, and fixed with cement. The head of the marker was stamped with the number of the triangulation station in Roman numerals, followed by a triangle with its apex at the centre of the head. The apex of the triangle is the geodetic point. As reference marks, four separate iron bolts were set in the rock, and fixed with cement. The bolts are each 6 feet from the geodetic point, and bear respectively north, south, east and west from it. Over the permanent mark a conical stone cairn was built, 7 feet in diameter at the base, 2 feet at the top, and 6 feet high. Surmounting the cairn the usual tin signal was placed for observing upon. The top of the signal is 8 feet vertically above the geodetic point. I afterwards discovered at some of the stations subsequently visited, that the Blaeberry signal is very hard to discern, and would perhaps be better situated on a more prominent mountain lying to the northeast of the station as at present located.

The descent from the mountain was made in three hours; we saw a herd of mountain goat which allowed us to approach to within 50 yards. During our six days' sojourn in the Blaeberry country we had three days' rain. During the other three days the weather was extremely hot, and mosquitoes were somewhat troublesome.

STATION XX (BEAVERFOOT).

After returning to Golden, we journeyed up the Columbia valley by the Government wagon road, our objective point being a cairn on the Beaverfoot range in township 24, range 19, west of the 5th meridian. The Beaverfoot mountains lie between Columbia and Beaverfoot rivers, and extend from Kicking Horse river in a south-

easterly direction. Between this range and the Dogtooth mountains on the west side of Columbia river, Columbia valley is low and flat and about 2 miles wide. The river is broad and slow of current, with numerous side channels, and during the greater part of the summer floods nearly all the low hay lands in the valley to a depth of 3 or 4 feet. When the water recedes in the autumn, the farmers cut a great abundance of slough hay from the wet meadows. This hay, when left uncut and protected by snow affords good pasturage for horses and cattle all winter, but when cut, it dries very quickly, and even when mixed with salt does not contain much nutriment. On the uplands of the valley the soil is sandy and dry, even gravelly, and needs irrigating, for which plenty of water may be obtained in the many streams flowing from the mountains. The timber is mostly small poplar and birch, which is easily cleared, although on the lower ridges of the mountains good fir is found, most of which is under license, and is at present being cut for railway ties. There are a number of good farms for 7 miles above Golden, then 6 miles or so of poor land, when the farms recommence and extend for 100 miles up the valley. None of the land on the west side of the valley is taken up, as there is no wagon road tapping it. The Kootenay Central railway, a branch line of the Canadian Pacific railway, which will connect Golden with the upper Kootenay and the Crowsnest, has 10 miles of its line under construction, but from what information I could gather I fear the inhabitants of the valley will have to wait some years yet before the line is completed and trains running. A weekly stage runs from Golden to Windermere, and a large flat-bottomed steamer navigates the sandbars of the river during the summer months between Golden, Spillimacheen and Windermere, carrying freight, and passengers who are not in a hurry.

It seems to me that the fruit industry, especially the hardy fruits, might be developed in this part of the Columbia valley. The sandy soil is suitable for fruit growing, and the protection which Beaverfoot mountains afford from the early sun would prevent destruction from frosts. Already some of the more enterprising farmers have experimented with some of the hardy fruits, and although the trees are still young, they are healthy and vigorous and bear good showings of apples, crab apples and plums. The valley also produces an abundance of strawberries, gooseberries, red currants and black currants, besides ordinary garden produce. Wild strawberries, raspberries, blueberries and service berries also grow in profusion.

The west boundary of Yoho Park reserve runs between ranges 19 and 20, west of the 5th meridian, to the south limit of the Railway Belt. There is a strip of excellent farming land therefore lying within the park, which cuts the valley like a wedge. I would respectfully point out that if the western boundary of Yoho Park was here altered and made to run along the western base of the Beaverfoot range of mountains from township 25, range 20, to the south limit of the Railway Belt, instead of along the astronomic meridian at present forming the boundary, the objects for which the park was extended would not be affected, but rather assisted, and, moreover, a goodly strip of agricultural and fruit-raising land thrown open to settlers.

Drewry's cairn on the Beaverfoot range was found by means of field glasses, and camp was pitched near the wagon road about 29 miles from Golden, with the cairn bearing N. 30° E., and distant about 3 miles. On crossing the lower ridges of the mountain through heavy timber, the main slope was reached and an easy ascent accomplished up a rocky spur facing the Columbia. By following well-beaten goat trails we soon gained the grassy meadows at timber-line and attained the summit of the mountain (altitude about 8,700 feet). While on the mountain we saw nearly thirty mountain goats, some of which were very shy, while others allowed approach to within 50 feet and moved away only when we hurled stones at them.

Station xx was marked with the orthodox brass bolt set flush in the solid rock and fixed with cement. The flat head of the marker was stamped with the number of the triangulation station in Roman numerals, followed by a triangle with its apex at the centre of the head of the marker. The apex of the triangle is the geodetic point. For reference marks four separate iron bolts were cemented in holes drilled in the

rock. The bolts are each 6 feet from the geodetic point, and bear respectively north, south, east and west from it.

Over the permanent mark a conical stone cairn was built, 6 feet in diameter at the base, 2 feet at the top and 7 feet high. Surmounting the cairn the customary tin signal was placed. The top of the signal is 9 feet vertically above the geodetic point. The summit of the mountain on which the station is situated is a long narrow one extending in the southeasterly direction of the range, and consists of three conjoined peaks. The rock at the summit is composed mostly of grey syenite-gneiss, and in consequence of the grey colour of the cairn this station is not readily discerned from a distance, especially from the direction of Spillimacheen. Subsequently I clothed the cairn with a mantle of white paint.

STATION XXI (SPILLIMACHEEN).

From our camp near the Beaverfoot triangulation station we returned to Carbonate Landing 17 miles from Golden. Here Columbia river was crossed to the west side by means of a row-boat, the horses swimming the main channel. At this season of the year, July 21, the river was very high, and covered the bottom lands of the valley, narrow fringes of cottonwood and willow alone breaking the broad expanse of water. Carbonate Landing some years ago was the lively gateway to the Spillimacheen, McMurdo and Lardo mines, but operations in these mining districts are now suspended, the landing is deserted, the ferry has disappeared, and the old hotel on the west bank of the river habited only by porcupines and pack-rats. Gold-bearing quartz has been discovered up the Spillimacheen, but not of a high grade; also argentiferous galena and copper pyrites in sufficient quantities to merit development if good shipping facilities could be obtained.

A good pack trail leads from Carbonate Landing to a low pass at the southerly end of the Dogtooth mountains, a distance of 5 miles. Here the trail forks, the left branch descending to the middle and south forks of Spillimacheen river, and the right branch of the trail dropping gradually for about 1,000 feet to Loon lake, a distance of four and one-half miles. This branch of the trail follows the left bank of the north fork of the Spillimacheen for about 30 miles to the pass at the heads of the north fork and Grizzly creek, where it connects with Grizzly trail, and finally emerges at the railway at Bear Creek station.

For about 25 miles from the mouth of Spillimacheen river, which empties into the Columbia some 40 miles above Golden, the Spillimacheen valley is very broad, with low timbered ridges and hills holding excellent timber, some of which is now being logged. Farther up the valley the several forks and smaller confluent of the river are separated by high ranges of mountains pointing down the valley like huge inverted wedges. Here the timber is of less value.

The valley of the north fork is separated from Canyon creek on the north by a range of mountains from 7,000 to 8,000 feet high. Between the north and middle forks the watershed is low for about 30 miles from the Columbia, when the mountains increase in height, rising to an altitude of 8,000 to 9,000 feet. On the first bald mountain of this range lying between the north and middle forks, triangulation station xxi (Spillimacheen) is situated, the cairn lying in the southeast quarter of section 25, township 24, range 22, west of the 5th meridian. The station may be reached from either the middle fork or north fork trail. We ascended to the cairn from a point on the north fork trail about 17 miles from Carbonate Landing, and were obliged to cross the north fork by means of a small raft, for although the stream is only some 30 feet wide, and 3 feet deep, the rapid current rendered fording impossible without a generous soaking. The ascent to the cairn was a comparatively easy one, being made up a rock slide on the north side of the mountain, and was accomplished in less than four hours (altitude 8,500 feet).

At station xxi the customary brass marker was set and cemented in the rock, and stamped with the number of the triangulation station in Roman numerals, fol-

lowed by a triangle with its apex at the centre of the head of the bolt. The apex of the triangle is the geodetic point. For reference marks four separate iron bolts were set in the rock firmly cemented. The bolts are each 6 feet from the geodetic point, and bear respectively north, south, east and west from it. Over the permanent mark a conical stone cairn was built, measuring 6 feet in diameter at the base 2 feet at the top, and 6 feet 6 inches high. Surmounting the cairn the usual tin signal was placed. The top of the signal is 8 feet 6 inches vertically above the geodetic point.

STATION XXII (NORTH FORK).

We continued up the North Fork trail, which was in bad condition with windfall, necessitating a great deal of chopping of dry logs, and progress was therefore rather slow. At about 23 miles from Carbonate a pack trail turns off to the left up McMurdo creek, a tributary of the north fork of the Spillimacheen, flowing from the south through a narrow gap in the mountains. Ten miles farther on, the trail and the valley bend northerly, with Bald mountain on the west, a prairie-like hill some 7,500 feet in height, dividing the north fork from Beaver river, and extending 9 or 10 miles to the north as far as Grizzly Creek summit, while on our right hand as we advanced up the valley, lay the large mountain on which Mr. Drewry's "North Fork" cairn was situated. Along the north base of this mountain flows Baird brook, a glacial stream 15 feet wide, entering the north fork about 5 miles from Grizzly Creek pass. From this brook, which is somewhat larger than the north fork, the latter stream takes its milky colour. We camped at the junction of the two streams, at an altitude of 5,800 feet.

There are a few patches of grass along the north fork which serve as pasture for packhorses, and camping grounds must depend on these. The soil is mostly sandy and covered with jack pine. Game is scarce all through the valley, except for a few grouse. On Bald mountain, however, caribou are plentiful, and smaller game as well.

The ascent to the sharp peak of station xxii is an easy one—the best route being up Board brook for about a mile and a half to a large slide on the north side of the mountain, where a gradual slope leads to the summit (altitude 9,000 feet). The orthodox brass marker was cemented in a hole drilled in the rock. The bolt was stamped with the number of the station in Roman numerals, followed by a triangle with its apex at the centre of the head. The apex of the triangle is the geodetic point. For reference marks were placed four separate iron bolts cemented in holes drilled in the rock. The bolts are each 6 feet from the geodetic point, and bear respectively north, south, east and west from it. A conical stone cairn was built over the permanent mark. It measures 6 feet in diameter at the base, 2 feet at the top, and is 6 feet high. Surmounting the cairn the usual tin signal was placed. The top of the signal is 8 feet vertically above the geodetic point.

The view from the sharp peak on which station xxii is situated is an exceptionally grand one, the many ranges of mountains to the north and east appearing low and scattered in contrast with the awe-inspiring black mountains and white glaciers—the monarchs of the Selkirks—which tower above the plateau-like Bald mountain in the west. The grandeur of mount Sir Donald, as seen from the many viewpoints along the Canadian Pacific railway, has been extolled by mountaineer and tourist, but to really appreciate its massive beauty one must gaze with cold dread upon its eastern form. Cold and bleak the dark mass rises almost precipitously from Beaver river, while clustered about stand mounts Macdonald, Avalanche, Uto, Eagle, Macoun, Donkin, Bonney, Dawson, Kilpatrick, and Wheeler, in dark contrast to the dazzling blue and white of countless glaciers and the clear outline of the trackless Deville and Illecillewaet névés.

The great precipitation of snow and rain which falls in Spillimacheen valley, and the cold wave which nightly visits that district, are doubtless caused by these immense fields of snow and rivers of ice, and the giant peaks which pierce the clouds. Our work in the Spillimacheen was greatly retarded by rain and snowstorms. We lost several

days at station xxi, and were forced to make ascents to station xxii. At the latter cairn we were twice caught in a snowstorm which rendered it dangerous as well as disagreeable on the mountain top.

On leaving our camp near station xxii we advanced 5 miles up the North Fork trail to the low grassy summit of Grizzly creek, (altitude 6,700 feet) where the waters of the north fork and the west branch of Grizzly creek head not more than 25 yards apart. The summit of the pass is covered with luxuriant grass, affording excellent pasturage for horses, while the bright gay colours of the many species of mountain wild flowers added greatly to the beauty of the spot. The Grizzly trail had not been travelled by horses for several years, and was littered with fallen trees, most of which had to be cut out as the trail runs along the steep mountain side so that there was no getting around obstacles which barred our passage. The trail follows the left side of the west branch of Grizzly creek high up on the hillside, but gradually descends until at about 9 miles from the pass the level of the main creek is reached. Here we were obliged to ford the stream as the old bridge had been washed away by the tempestuous glacial creek. The trail then follows the right bank of the stream westerly for 2 miles, when a branch trail turns off to the south, crosses the Grizzly, and ascends Beaver valley. The main trail here swings to the north and descends the right or east side of Beaver river for two and one-half miles where it crosses the rapid stream by a new bridge. Then descending along the left bank for half a mile it crosses the mouth of Bear creek and commences to ascend the mountain side to quickly emerge at Bear Creek railway station.

From Bear Creek there is no trail or tote road either up or down the railway, although there is not much trouble in taking horses up the track to Rogers pass, 6 miles away, and from there to Glacier. Northerly from Bear Creek it is impracticable to conduct horses on account of the high bridges by which the railway crosses the many turbulent mountain streams running through deep canyons.

STATION XXIII (BEAVERMOUTH).

The next triangulation station visited was "Beavermouth," cairn which is reached from the railway station of that name. Beavermouth is a small lumbering hamlet lying in Columbia valley where Beaver river enters the Columbia just as the latter turns northward to the Big Bend. The valley near Beavermouth is rather narrow, the river flowing close to the base of a mountain on the north side so that the only bottom lands are on the south side of the river. These bottom lands are low and marshy and are superb breeding places for myriads of mosquitoes, which made our lives miserable during our sojourn in this vicinity in the early part of August. Never have I suffered so much from the onslaughts of these female pests, not even among the sloughs on the British Columbia coast nor in the muskegs of Alberta. And for many a day I shall vividly recollect the frantic time we spent at Beavermouth endeavouring to snatch a few mouthfuls of food under our veils, and attempting to woo Morpheus with our lungs full of smoke from smudge-fires.

At Beavermouth there is a saw-mill which is in operation most of the season, with a dozen to twenty houses for the mill hands, but there is no store or hotel. Quartz creek flows into the Columbia here from the south, but the old trail up the creek has not been used for many years and is now impassable for horses, as the auriferous quartz found up the creek did not turn out to be sufficiently rich to pay. There is good timber both up and down the Columbia, up Beaver valley, and on the lower slopes of all the mountains. Game is fairly plentiful in this vicinity, there being many bear in Beaver valley, and deer in the mountains.

Immediately south of Beavermouth, and on the most northerly mountain of a low range lying between Quartz creek and Beaver river lay Drewry's cairn, to reach which we had to make a long and wearisome ascent of 4,500 feet through timber, brush and berry bushes, and for a distance of over 4 miles before reaching timber-line; and I invoked blessings on Mr. Drewry for blazing the route through the dense timber.

Although the station is situated on a very low mountain, at an altitude of only 7,250 feet, it is admirably located for the purposes of triangulation, as there are no mountains obstructing the line of sight towards "Blaeberry," "North Fork," and "Bonney," and an uninterrupted view is obtained up the valley of Mountain creek, which solved the difficulty of carrying the triangulation across the summit of the Selkirks.

Station xxiii was marked with the customary brass bolt cemented in a hole drilled in the rock. The bolt was stamped with the number of the triangulation station in Roman numerals, followed by a triangle having its apex at the centre of the head of the bolt. The apex of the triangle is the geodetic point. For reference points were placed four separate iron bolts cemented in holes drilled in the rock. The bolts are each 6 feet from the geodetic point, and bear respectively north, south, east and west from it.

Surmounting the permanent mark a conical stone cairn was built, 7 feet in diameter at the base, 2 feet at the top and 8 feet high. The usual tin signal was placed over the cairn. The top of the signal is 10 feet vertically above the geodetic point. The summit of the mountain is low and broad, and to make the signal easily discernible from a distance the cairn was painted white.

STATION XXV (MOUNT BONNEY).

From Beavermouth we journeyed by rail to Glacier, where I made inquiries from the Swiss guides employed by the Canadian Pacific Railway Company as to the best route for ascending Mount Bonney, for I had come to the conclusion that a triangulation station on that lofty mountain was almost a necessity. From Edouard Feuz, the veteran Swiss mountaineer, who already has had a wide experience amongst the Selkirks, I learned that the only ascents of Mount Bonney which have been accomplished were made either via Loop creek and Mount Green, or by way of the Asulkan pass and Mount Swanzy; yet he was firmly of the conviction that the best ascent of Mount Bonney was to be made from the south side and would prove a most interesting climb. As it was necessary for me to ascend Flat Creek pass, which lies south of Mount Bonney, in order to make an official visit to the hitherto invisible cairn "Incomappleux," as well as to reach Battle Creek cairn, I decided to follow the guide's advice. Consequently we left Glacier for Flat Creek siding, a distance of 9 miles by trail. From Glacier a trail leads down past the great Loop to near Cougar creek, this trail having been recently cut out by the Canadian Pacific Railway Company in order to reach the wonderful caves near Cougar creek. The last few miles to Flat Creek siding had to be made along the railway track, and I might remark, by way of parenthesis, that one of the most unpleasant duties of the season's work was driving impish pack horses along the railway track. Between Donald and Revelstoke there is no trail or tote road, and to go from one intermediate point to another it is necessary either to ship by rail, or to "count the ties." And a day's journey with pack horses along the railway track, with incessant dodging into narrow ditches to escape destruction from unexpected trains, well, the trials of such a day were enough to tax the temper of a saint.

Flat creek, a mountain stream about 15 feet wide, flows into Illecillewaet river from the south almost opposite Caribou creek. A good trail follows the east side of this creek in a southerly direction for five and one-half miles to the summit. The first 3 miles is through good heavy timber, but as the summit is neared the valley is comparatively open. Slick creek also heads at the pass and flows in a southeasterly direction for three and one-half miles into Incomappleux river. Flat creek pass has an altitude of 4,950 feet, is about a half mile wide, and covered with luxuriant grass. Mountains rise on the east and west sides about 3,300 feet above the pass, and their lower slopes are covered with heavy green timber. Berries grow along the pass and lower slopes of the mountains in great abundance, and from the middle to the end of August attain perfection. Red raspberries, wild gooseberries, black currants and blueberries are plentiful, a delicious large black species of huckleberry (*Vaccinium Myrtilloides*) being most abundant.

We found the Incomappleux cairn on the mountain to the east of the pass, and it was undoubtedly evident that the cairn could not be used for a triangulation station as neither "Beavermouth" nor "North Fork" cairn was visible therefrom.

As Mount Bonney has been ascended on only a very few occasions and is considered one of the worthy climbs in the Selkirks it may perhaps be interesting to describe this first ascent from the south side. Leaving our camp on Flat Creek pass we took a small silk tent, blankets, food for three days, and a few cooking utensils, besides our usual load of a transit, camera, tripod, brass marker, reference bolts, drill, drilling hammer, cement, tin signal, wire, etc., which made good packs for the three of us. On account of the high altitude of our starting point we were soon out of the dense timber and brush and in two hours and a half after leaving camp we reached timber-line of the mountain lying east of the pass. From this elevation we could see the huge form of Mount Bonney lying about 4 miles away in a northeasterly direction. The three conjoined peaks just emerged from the immense glacier and névé which covered the whole face of the mountain, except where a long ridge or arête extended from the easterly end of the summit and sloped gently down in a southerly direction towards Incomappleux river, separating Bonney névé from Clarke glacier. This arête seemed to be the objective point for our ascent. We crossed the small snowfield which lay on the western slope of the mountain on which we stood, and dropped over the northeasterly side of the mountain, down a glacier and couloir which led us past precipitous rock faces over tumbled masses of fallen rock across a wonderful quarry of creamy pink marble, down into a beautiful alpine meadow. Through the pale grasses of this meadow we advanced northeasterly for a mile. We met a herd of mountain goats in the meadow, but our arrival and strange appearance did not seem to disturb these phlegmatic animals for they merely stopped feeding as we approached, and watched us with a passive interest; and not until we were within a hundred feet did they decide to depart, then quietly turned about and walked slowly away some of them even grazing and cropping as they went.

As we neared the main base of Mount Bonney our progress was stopped by a deep gulch through which ran a stream heading from the glacier on the south side of the mountain, and flowing in a southerly direction being part of the head-waters of the Incomappleux. It was now two o'clock in the afternoon so we decided to camp in the alpine meadow we had just crossed. We took off our packs, and pitched our tents beside a small trickling brook, and in the shelter of a group of stunted fir. Soon we had a roaring log fire ablaze and its warmth was greatly appreciated as the air grew quite chilly at this high altitude (7,000 feet) as soon as the early sun disappeared behind the western peaks.

Leaving our little camp in the meadow at 6 a.m. (August 22), we followed the edge of the deep gulch separating us from Mount Bonney, until we gained the head of the stream at the tongue of the glacier. Crossing the stream we skirted back on the left or east side of the gulch for half a mile, when we commenced the rocky ascent of the ridge where we had decided the easiest ascent was to be found. On this mountain, as indeed in all our climbs, we failed to show the true mountaineering spirit, which, I am told, has a penchant for seeking the most difficult routes of ascent; instead, we always carefully searched for the safest and easiest route. After ascending some 1,200 feet we reached the edge of the arête between Bonney névé and Clarke glacier. We then struck northerly along the narrow ridge of rock, and when possible walked briskly on the crisp snow of the sloping névé. After a steady pull of two hours and a half (the whole ascent from our flying camp occupying five hours) we reached the summit of Mount Bonney (altitude 10,205 feet), and such a view! Fields of snow and rivers of ice, some of the largest névés known to man, extended to the north, the east and the south. Illecillewaet, Deville, Van Horne and Bonney névés, and the mighty glaciers below these tracts of snow. The highest peaks of the Selkirks clustered around—Duncan, Purity, Wheeler, Dawson, Fox and Sir Donald. To the north was the Hermit range, with the Swiss peaks and the Camels. Far away to the north-

west stood a heterogeneous mass of snowy mountains, yet unnamed and yet unwon. Like mere plateaus in the undulating valley appeared Mounts Afton and Abbott, these worthy climbs from Glacier House. Five hundred feet below our feet over the precipitous northern ledge of the summit lay Bonney glacier, from which flowed a small creek towards and under the great loop of the railway whose snake-like form we could discern in the distance. The summit of Mount Bonney extends for 200 feet east and west, but it is a mere ledge of rock north and south. It is composed of three united peaks of almost equal height, the middle one, however, having the advantage by a few feet.

Station xxv is situated on the summit of Mount Bonney, in the Selkirk range, at an altitude of 10,205 feet. It lies in section 10, township 26, range 26, west of the 5th meridian. The station is marked by the customary brass bolt set and cemented in a hole drilled in the rock. The head of the marker is stamped with the number of the triangulation station in Roman numerals, followed by a triangle with its apex at the centre of the head of the bolt. The apex of the triangle is the geodetic point. For reference marks were placed two iron bolts set and cemented in holes drilled in the rock. The bolts are each 6 feet from the geodetic point, and bear respectively north and east from it. Two other reference points were also marked at this station, being crosses cut in the rock; the centre of each cross is 6 feet from the geodetic point, and they bear respectively south and west from it. Over the permanent mark a conical stone cairn was built, 6 feet in diameter at the base, 2 feet at the top, and 6 feet 6 inches high. Surmounting the cairn the customary tin signal was placed. The top of the signal is 8 feet 6 inches vertically above the geodetic point.

The day of the ascent was fine and warm, with very little wind. The thermometer registered 97° F. at the summit at 2 p.m. The descent to our flying camp in the alpine meadow was made in three hours, and thence to the main camp in Flat Creek pass in four hours.

From Flat Creek pass we set out for Battle creek to seek the cairn set by Mr. Drewry in the vicinity of that creek, although I had been unable to discover it from any station already occupied. The trail followed the west side of Slick creek, and about two and a half miles from the pass, Jeopardy slide was met, which the trail crossed and descended by many switch-backs cut in the deep slide overgrown with alder, devil's club and other brush. At the slide a branch trail turned off to the right leading up to some mining claims which are being developed near the head of Bain brook. At these claims, and some on Incomappleux river, a high grade argentiferous galena ore is found, and these mines should prove to be paying propositions in the near future.

At about four and one-half miles from the pass the bed of Incomappleux river was gained, the river here flowing through gravel flats and fifty yards wide. The trail crossed the mouth of Bain brook, and followed the west shore of the Incomappleux for one and one-half miles to a narrow gorge in the river, where some old stringers showed us that a bridge had once spanned the stream. As it was impossible to cross the rushing river at this point, we retraced our steps half a mile, and forded the stream at the shingle flats. The trail ran along the east side of the river, crossing the broad slides where huge avalanches had carried away every vestige of green timber. These slides were overgrown with a rank entanglement of alder thicket, devil's club, nettles and brush, growing over 5 feet high, through which search for the trail was a trying task. After six miles of the most disagreeable travelling we had experienced all summer we reached Battle creek, 13 miles from Flat Creek pass. Battle creek is a large tributary of Incomappleux river, flowing into it from the east; it rises from several large glaciers near the head of Beaver and Duncan rivers, and is a rapid stream some 25 feet wide, flowing mostly through rocky canyons. The bridge over Battle creek was gone, and we set our main camp on the north side of the creek near the trail. Some grass for horses may be found on the slides along a great part of the trail; and several small meadows along the Incomappleux, just below Battle creek, afford good

pasturage for horses. These meadows are the haunts of herds of caribou and elk. Bears, too, are plentiful throughout the valleys of the last-mentioned streams, especially in the month of August, when the many species of berries are ripe. There is some good timber along the Incomappleux, which it might be possible to drive to the Arrow lakes, in spite of the rapids and falls in the river. There is one fall of 50 feet on the Incomappleux about three-quarters of a mile above Battle creek. I saw some enormous cedar trees in the Incomappleux valley, fully ten feet in diameter, but they were mostly rotten at the centre.

After making a tentative ascent of a mountain near our main camp at Battle creek, we took packs on our backs and went up the left side of the creek through very rough country. About 3 miles from the mouth of the stream we ascended to the timber-line of a range of mountains lying south of the creek, called Battle range. From the peak of one of these mountains I searched in vain for Mr. Drewry's cairn, which he placed in this vicinity. Every mountain for miles around I swept with telescope and field glasses, and soon came to the conclusion that the cairn no longer existed. An enormous mass of tumbled rock showed where a high peak had once stood, but now lay scattered and fallen on the neighbouring slopes. I placed a reference cairn on a high mountain to the east, but as neither station xxi nor xxii was visible therefrom, no permanent mark was set. I was unable to locate any of the peaks I had seen from "Spillimacheen" and "North Fork" cairns, but am of the conviction that a satisfactory location of station xxiv can be found near the heads of Beaver and Duncan rivers. On giving up the hope that anything further could be accomplished in the vicinity of Battle creek, we returned to Flat creek siding, whence the horses were sent to Albert canyon along the railway track. From Albert canyon a wagon road follows the north fork of Illecillewaet river for 29 miles, to the summit of the north fork and Downie creek, where the Waverley and Tangier mines are located. The wagon road was built at great expense by the Provincial Government to encourage the development of the mines, but after a considerable sum of money had been spent by the English syndicate which had bought the Waverley mine, and after gross mismanagement, and even misappropriation of funds, if we are to believe the tales that are told, the mine was closed without shipping any ore. The Lanark mines at Laurie, a pretty little mining town between Flat creek and Albert canyon, have a somewhat similar history. By sad experience it has been learned that Canadian mines cannot be successfully operated from Piccadilly, and the present dormant condition of British Columbia mining is the sorrowful result. I understand, however, that the Waverley, Tangier and Lanark properties are all considered good propositions, and I saw excellent specimens of argentiferous galena from these and other mines on the north fork of the Illecillewaet, Corbin pass, Bain brook and the Incomappleux. The impetus given to British Columbia mining during the last year, especially in Rossland and the lower Kootenays, leads me to believe that the next few years will see renewed activity all through the province, although it is difficult to conjecture just what effect the present boom in Cobalt will have on British Columbia. Will the much-needed capital be diverted to the wonderful silver district in northern Ontario, or rather will not confidence be awakened in all Canadian mining?

STATION XXVI (ILLECILLEWAET).

The Illecillewaet valley at Albert Canyon railway station is about half a mile wide, and there are here a couple of prosperous farms. A mineral spring, with water of tepid temperature, gushes from the base of a mountain quite close to the village. The wagon road leading up the north fork of the Illecillewaet crosses the main branch of the Illecillewaet, about one and one-half miles from the railway, by a wooden bridge, then swings to the left towards the north fork, whose mouth is one-half mile below the bridge. The road then follows the east side of the north fork for about 3 miles, crosses the stream by another bridge, and continues up the west side of the

river for 5 miles through some excellent stretches of spruce, hemlock, cedar and fir. In several places gumbo slides had cut away the road, and we had to hack out a trail with mattocks. At about 9 miles from the railway the road again crosses the river, at a broken-down log stopping-house, locally known as "Klondike," and from here to the summit the road follows the east side of the stream. The north fork is a rapid glacial stream from 20 to 50 feet wide, with an average depth of 3 feet. In its lower waters small trout abound. The valley is comparatively narrow, with good timber on both sides. The mountains guarding the west are stern and forbidding, rising about 9,000 feet high, and mostly laden with snow. Those on the east have a gentler appearance from the valley, except the snow-capped Corbin peak, and in many green meadows near the timber-line herds of caribou range. Bear, too, are plentiful, and cougar have been seen.

At about 6 miles from "Klondike" we arrived at another log stopping-place called "The Farm." Here we camped to spy out the mountains, and after some tentative climbs on neighbouring peaks in order to locate a satisfactory station, I decided on a mountain lying N. 30° E. from the old hotel. After an easy ascent to the summit, I placed station xxvi (Illecillewaet) with the usual brass marker set and cemented in the rock. The marker was stamped with the number of the station in Roman numerals, followed by a triangle with its apex at the centre of the head of the bolt. The apex of the triangle is the geodetic point. For reference marks were set and cemented in the rock four separate iron bolts. The bolts are each 6 feet from the geodetic point, and bear respectively north, south, east and west from it. Over the permanent mark was built a conical stone cairn, 6 feet in diameter at the base, 2 feet at the top and 6 feet high. Surmounting the cairn the usual tin signal was placed, and the cairn draped with white cotton. The top of the signal is 8 feet vertically above the geodetic point.

During our stay up the valley of the north fork we were troubled with incessant rains and fresh snow on the mountains.

STATION XXVII (ALBERT).

Returning to Albert canyon we moved by pack horses down the railway track a distance of 10 miles to Twin Butte bridge, where by a bridge 65 feet high the railway crosses the small twin creeks flowing from the south into the Illecillewaet. There was no horse feed in this vicinity, so I sent the horses back to Albert canyon in care of two men. We ascended a mountain lying in the northeasterly bend of Twin creek east, and found Drewry's cairn on a spur of the mountain along whose base the railway runs. I set a cairn and signal for station xxvii on a higher peak to the east, but did not place a permanent mark, as the final position of this station depends on the alteration of station xxiv, as well as on the yet unlocated stations westwards towards Revelstoke. While on the mountain setting this station, we were caught in a snow-storm which kept us up above for two days, during which time we suffered considerably from the wet and cold. The descent of the mountain through the fresh deep snow was extremely disagreeable and trying, especially as we were encumbered with heavy packs.

From our experience on the west slope of the Selkirk I should say that the early part of the season is the only time of the year to accomplish satisfactory triangulation work in this district, for the precipitation here from the moisture laden winds from the Pacific is enormous, especially during the month of September.

BASE LINE.

As it was now about October 1, and the season for mountain work pretty well advanced, I decided to return to the Columbia valley to attend to the important work of selecting a place for measuring a base line, which according to my instructions "should not be less than five miles." From what I had seen of the mountainous country between Revelstoke and the eastern slope of the Rockies, I was fully aware that it

would be no easy task to find a stretch of country which would give a straight line 5 miles in length whose extent would be comparatively level and unbroken by wide channels or marshes. With the base line in view all season, I had carefully looked over all the country through which we passed, and had decided that the only available solution was to be found in the Columbia valley between Donald and the south limit of the Railway Belt, a distance of some 50 miles. I hoped to obtain a dry level stretch of 5 miles along the bottom lands of Columbia river, for I had been assured that all the sloughs would dry out in the fall. Dry out they did, sufficiently to allow the farmers to cut slough hay along the edges, but it was a different proposition when it came to lay out a Euclidian line 5 miles in length. The presence of bullrushes and marsh grasses, the muskrat domes, and flocks of wild ducks and geese were indisputable evidence that the water would remain until the frost and snow came. However, the familiarity I had gained with the country, assisted by maps and previous surveys, at length enabled me to locate a satisfactory line along the edges of the bottom lands of the Columbia about 21 miles above the town of Golden. The base line as established measures approximately 427.88 chains, chained with a steel tape; the line lies along the right shore of Columbia river near the wagon road, in townships 24, ranges 19 and 20, west of the 5th meridian. It runs mostly through small poplar and birch with occasional patches of spruce and fir. The mountains on each side of the valley are exceptionally suitable for extending the base to the main triangulation by three or four intermediate stations. Temporary marks and signals were erected on the base in preparation for linear and angular measurements next season.

STATION XXVII (ALBERT).

The survey season for mountain work is very short, extending from the first or second week in June until the middle of October, for after the latter date the fresh snow which nightly falls on the mountains renders distant signals invisible besides making climbing disagreeable and dangerous. During the season the work of the survey is greatly retarded by rains and cloudy weather, and when much travelling is done it is rather difficult to make good use of such fine days as are suitable for climbing and observing. During the latter half of the month of June, near the summit of the Rockies, it rained seven days. In July, while we were in Columbia valley, and up the north fork of the Spillimacheen, it rained twelve days. In August at Beaver-mouth, Incomappleux and Flat creeks, we had beautiful weather, with only eight days rain. But in September, on the western slope of the Selkirks we had only ten fine days all month. In the Columbia valley during the month of October, we had twelve days on which it rained, eight days were more or less cloudy and unsuitable for mountain work, while the remaining eleven days were fine and clear.

Dense smoke, filling the valleys and obscuring the mountain peaks also seriously retards the work of mountain surveys, for a short period every summer. While we were at Beaver-mouth during the first week in August, the thick smoky haze which we first noticed at Bear creek grew rapidly worse, and soon filled the Columbia and Beaver valleys, obscuring the view of the mountains almost without interruption for a fortnight. The smoke came from numerous forest fires up Bush river, Columbia river above Golden and at Albert canyon. Each year these large forest fires destroy much valuable timber and are a serious menace to the timbering industry as well as to the safety of public and private property. Whether these fires all result from uncontrollable natural phenomena or from wilful negligence on the part of campers and prospectors it is difficult to ascertain; although I am certain of this, that men who have occasion to light fires in a timbered country during the dry season, do not always take proper precautions to see that their fires are completely extinguished; and I know from experience that a small fire which seems black and dead, may still be smouldering in the dry moss and loam, and on the slightest provocation from a friendly breeze may soon develop into a dangerous and destructive forest fire. The Bush Fire Act, while a stringent law, cannot be enforced over such a large territory without the interested co-operation of every man in the province.

Of flora and fauna I shall not speak. The many genera and species of mountain wild flowers which bloom with gay colours in valley and on mountain side are a continual source of pleasure and study to all lovers of nature, to whom I would recommend that excellent compilation "Mountain Wild Flowers of Canada," by Mrs. Julia Henshaw, a Canadian. Professor Macoun's appendix to Mr. A. O. Wheeler's "The Selkirk Range" deals exclusively with the mammals, birds, fish, flowers and berries of the Selkirks. And to those who are interested in large game "Camp-fires in the Canadian Rockies," by Hornady-Phillips will prove most instructive and fascinating. Every day we hear the lament that large game is becoming scarce, nay, extinct, in the mountains, but I assure all pessimistic hunters that there is game aplenty yet, if they are not too lazy to go a day's journey from the noisy railway.

P. A. Carson, D.L.S., 1907.—Beaverfoot Range, Carbonate Landing, Kapristo Mt., Spillimacheen, Mt. Laussedat, Blackwater, Bush river, Sugarloaf Mt., Mt. Sandford, Mt. Cupola, and Mt. Sentry, etc.

SIR,—I have the honour to submit for your consideration the following report of my field operations for the triangulation survey in British Columbia, in connection with the Trigonometrical Section of the Topographical Survey of Canada, for the season of 1907. This report is accompanied by a topographical map, on a scale of six miles to an inch, showing the whole triangulation in the Rocky and Selkirk mountains as it stands at present. The map shows also the topography of that part of the Railway Belt, British Columbia, which lies north of the Canadian Pacific railway, and west of Blaeberry river, that is, the districts drained by Blackwater creek, Bush river, Gold creek and Six-mile creek. The topography and the positions of the important features have been determined by means of triangulation, track surveys, photographs, and miscellaneous information, and names have been given to the principal mountains and streams.

I left Ottawa on June 7, for Golden, B.C., where my outfit had been stored at the close of the previous season. My horses I found in excellent condition after a very severe winter in the Columbia valley, 29 miles south of Golden. The horses had managed to forage very well in the sloughs along Columbia river, until the approach of spring, when the heavy crust on the snow prevented them from reaching the grass, and it was therefore necessary to give them chopped feed for several weeks. Considering the severity of the winter, which seems to have prevailed throughout Canada, and from some of the reports of the death of horses and cattle on the ranges in other districts, I was well satisfied with this vicinity as a winter range. I purchased two more horses in the Columbia valley at fifty-five dollars each, bringing the number of my horses up to eight.

It was found impossible to obtain skilled packers at the standard wage of two dollars *per diem*, so I was obliged to pay seventy-five dollars per month in order to secure a good man. The remainder of my party was engaged in Golden, only two of last year's quota being available.

BASE LINE.

I first visited the base line which was established during the season of 1906 in the Columbia valley, 21 miles south of Golden. The whole extent of the line was this year cleared out and prepared for final measurement, and the ends of the base were marked in a permanent manner, as described in your instructions.

At "A," the southerly end of the base line, which is situated in the northeast quarter of section 16, township 24, range 19, west of the 5th meridian, the end was marked as follows: The true end of the base line is an underground mark, being the intersection of a pair of fine lines in the upper end of a brass bolt, such as is used for marking the triangulation stations. This brass bolt is six inches long and three-quarters of an inch in diameter. It has a flat head one and one-half inches square

and one-half inch thick. The bolt was firmly set in concrete, three feet below the surface of the ground (i. e., below the frost line). The head of the bolt was also marked with the letter "A," and the words "End of Base, Canada." The underground mark was covered with loose earth level with the original surface of the ground.

A set of four witnesses was securely placed in concrete, being iron reference bolts, each 16 inches long, and three-quarters of an inch in diameter. A cross was marked on the head of each bolt, the centre of the cross in each case being three feet distant horizontally from the geodetic end of the base. These reference bolts bear respectively north, south, east and west from the geodetic point.

At "B," the northerly end of the base line, which is situated in the northeast quarter of section 35, township 24, range 20, west of the 5th meridian, the end was marked as at "A," except that the head of the bolt bears the letter "B." A set of four witnesses were also placed in a similar manner to that at "A."

It was deemed undesirable to place a permanent surface mark or monument over the ends of the base, as is generally done in geodetic surveys; but a temporary signal for observing upon was erected at each end of the base, being a triangular wooden pyramid 3 feet wide at the base, and 3 feet 6 inches high. The signals were covered with white cotton to assist in clearness of vision.

Each end of the base was accurately tied to the neighbouring survey posts of the Dominion system of survey, and a plot of ground, one chain square, is to be reserved at each end of the base for the purpose of the triangulation.

PROJECTION OF BASE LINE.

In order to project the base line of five and one-quarter miles extent, to the main triangulation, in which the sides of the triangles are from 15 to 20 miles long, a set of three secondary stations was established, viz.: Station "C," on Beaverfoot range, opposite the base line, station "D," on a wooded ridge on the west side of Columbia valley, opposite the base line and station "E," on the summit of Kapristo mountain near the northerly end of Beaverfoot range. By means of these three stations the base line is connected with station xvii (Mount King), station xx (Beaverfoot) and station xxi (Spillimacheen) of the primary system.

STATION "C."

Station "C," for the projection of the base line, is on the summit of the Beaverfoot range, at an altitude of about 8,000 feet. The mountain is easily reached by means of a pony trail running from Columbia valley wagon road, at a point near Biebernitz's ranch. This trail leads up the side of the mountain, and horses lightly packed may be easily taken to timber-line. The station is marked with the usual brass bolt securely cemented in a hole drilled in the rock. The top of the bolt is stamped with the letter "C," followed by a triangle. The apex of the triangle is at the centre of the bolt, faces north, and is the geodetic point. Three reference bolts were also firmly cemented in the rock, each being 6 feet horizontally from the geodetic point, and bearing respectively north, south and west from it. Directly over the brass bolt a conical stone cairn was erected, 4 feet in diameter at the base, and 6 feet high. The cairn tapers to a point at the top, which is vertically over the geodetic point. White cotton was wound around the cairn to serve as a signal.

STATION "D."

Station "D," for the projection of the base line, was established on a wooded ridge on the west side of the Columbia valley, opposite the base line. The station is just south of the pass leading from Carbonate Landing to Spillimacheen valley. A spot on the ridge was cleared of timber so as to give unobstructed vision towards both ends of the base, and towards stations "C," "E," and "xxi." The station was marked by means of the usual brass bolt, cemented in a hole drilled in solid rock 12 inches below

the surface of the ground. The head of the bolt was stamped with the letter "D," followed by a triangle. The apex of the triangle which is at the centre of the top of the bolt, faces north and is the geodetic point. Directly over the geodetic point was erected a wooden signal, in the shape of a tetrahedron, 5 feet high. The signal was covered with white cotton to assist in clearness of vision.

STATION "E" (KAPRISTO MOUNTAIN).

Station "E," the third station for the projection of the base line to the main-triangulation, was established on July 10, on the summit of Kapristo mountain (altitude 8,900 feet), one of the most northerly and highest peaks of the Beaverfoot range. The station was reached via an old smugglers' trail leading from Carbonate Landing to a high pass over the Beaverfoot mountains. At one time the trail led down into the Beaverfoot valley, but has fallen into disuse since the building of the Canadian Pacific railway, and is impracticable for horses. From this pass above timber-line the summit of the range was followed northerly until Kapristo mountain was reached, overlooking the town of Palliser, on the Canadian Pacific railway. Angles were read towards station xvii (Mount King), station xx (Beaverfoot), station xxi (Spillimacheen), and stations "C," and "D." The station was marked in a permanent manner with the usual brass bolt firmly cemented in a hole drilled in the rock. The flat head of the bolt was stamped with the letter "E," followed by a triangle, with its apex at the centre of the top of the bolt. The apex of the triangle faces north, and is the geodetic point. Directly over the geodetic point a conical stone cairn was erected 5 feet in diameter at the base, 1 foot at the top and 6 feet high. The top of the cairn is vertically above the geodetic point. Four reference bolts were also securely cemented in the rock, each being 6 feet horizontally from the geodetic point, and bearing respectively north, south, east and west from it. White cotton was wound around the cairn to act as a signal.

While we were on the summit of Kapristo mountain establishing triangulation station "E," an electrical storm came from the northwest, and we were soon enveloped in heavy dark clouds. A strange buzzing sound was heard, which seemed to proceed from our alpenstocks which we had placed in an erect position in the rocks. Then our faces commenced to tingle, as though swept by innumerable cobwebs, and our hair rose and fell from our scalps. A most peculiar tingling sensation pervaded our whole bodies and we looked at each other with half fear, half laughter on our faces, not knowing what to make of the situation. However, I decided to go ahead as though nothing strange were occurring and laid my hand on the metal of the theodolite. A sudden shock almost knocked me off my feet, and the smothered exclamation from my lips finished the oozing remnants of bravery which the others were displaying. In less time than it takes to tell it, all three were seeking shelter beneath some overhanging rocks 50 feet below the summit, and each one, I am sure "searching his soul for sounds to tell how scared he was." The storm, however, passed as quickly as it came and we resumed work at the station.

STATION XX (BEAVERFOOT).

On June 26, I visited station xx in order to learn whether I could move it a little farther north and still see station xiv (Storm mountain), and also to locate a suitable position for station "E." Even at this late day in June the snow of the past winter lay far below the timber-line, while the peaks were so deep in snow that the cairns on Storm mountain and Mount King were completely invisible. I destroyed the markings for station xx and subsequently erected a new station on the mountain immediately north of the old one. The markings for the new station are the same as before, except that only three reference bolts were placed. Each witness is distant 6 feet horizontally from the geodetic point and they bear north, south and west from it. The cairn is 5 feet in diameter at the base and 8 feet high.

STATION XXI (SPILLIMACHEEN).

Station xxi was established in 1906 on the peak where Mr. W. S. Drewry, D.L.S., had placed a cairn fifteen years before. It was afterwards discovered that the location was unsuitable for a triangulation station, as the cairn is invisible from any of the peaks in the vicinity of Battle creek. Consequently in 1907 this station xxi was removed to a higher and more commanding peak a couple of miles westerly, in the same range of mountains. From the new station also a location for station xxiv was determined upon to take the place of the cairn called "Battle Creek," and the magnificent mass of mount Sugarloaf was picked out. The mountain on which station xxi is situated may be reached either from the north or middle forks of Spillimacheen river, although probably the easier ascent may be made from the latter. If, however, it is desired to visit station xxii (north fork) directly afterwards, a saving of time is made by travelling via the north fork trail.

STATION XIX (MOUNT LAUSSEDAT).

The station established by Mr. W. S. Drewry, D.L.S., on the westerly side of Blaeberry river, was afterwards discovered to be unsuitable for the continuation of the triangulation westward. Consequently, in 1907, I destroyed station xix (Blaeberry) as situated, and placed the station on mount Laussedat (altitude 10,000 feet), about 3 miles in an northeasterly direction from the old station. Mount Laussedat is a high and prominent mountain commanding the Blaeberry and Waitabit valleys. The mountain may be reached from either of these, although perhaps the more easily from the former. The ascent of mount Laussedat is by no means an easy one, for in the upper heights are several reaches of almost sheer rock. Our camp was placed on the left or east side of Blaeberry river, about 15 miles from Moberly, and several miles above Blaeberry canyon and falls. Here we built a foot-bridge over a narrow part of the river, and with packs on our backs ascended a ridge leading northward towards mount Laussedat. We bivouacked at timber-line, and the following morning commenced the ascent of the main mountain. After some difficult rock climbing, and an ascent up an almost precipitous snow couloir occupying five hours from timber-line, the summit of mount Laussedat was reached.

Station xix is marked in the usual way with a brass bolt set in cement in a hole drilled in the rock. The top of the bolt is stamped with the Roman numerals xix, followed by a triangle having its apex at the centre of the head of the bolt and pointing north. The apex of the triangle is the geodetic point. As reference marks there were drilled in the solid rock two holes, one due south of the geodetic point and distant 6 feet horizontally from it, and the other due west of the geodetic point and 4 feet 6 inches horizontally from it.

Over a brass bolt a conical stone cairn was built, 4 feet in diameter at the base, 1 foot at the top and 6 feet high. The top of the cairn is vertically above the geodetic point.

While on the summit a snowstorm set in which made it exceedingly disagreeable and cold during the enforced stay at the top. The descent to timber-line was made in four hours, being rather hazardous on account of the falling snow. Our trip up the Blaeberry occupied eight days, from July 15 to July 22 and five of these were rainy.

STATION XXVIII (BLACKWATER).

Station xxviii (Blackwater) is reached from the old town of Donald, on the Canadian Pacific railway by way of the Government pack trail from Donald to the Big Bend of Columbia river, and Tête Jaune Cache, near the Yellowhead Pass. The trail crosses Waitabit creek by means of a bridge about a mile north of Donald, then follows a northwesterly course for four and one-half miles to point on Bluewater creek about 3 miles from its mouth. A bridge crosses the Bluewater just where Blackwater creek falls into it, and the trail ascends Blackwater valley. The first

3 miles of trail are on the left or east side of the stream when the trail crosses and follows up the right bank for 7 miles to a point opposite Blackwater lake. Here we descended on a branch trail to the level of the lake and camped at its southerly end. The lake is about one mile in length north and south about 300 yards wide, and empties into Blackwater creek. Its elevation is 3,150 feet. It teems with fine rainbow or mountain trout from 6 to 18 inches in length. From Blackwater lake an old miners' trail leads northeasterly up Blackwater creek, coming from between the two most southerly mountains of Blackwater range. At timber-line an old deserted mine is reached, from where the ascent to Blackwater mountain is easily made in three hours (altitude 9,000 feet). This mountain is one of the highest peaks of Blackwater range and indeed of the district drained by Waitabit, Bluewater and Blackwater creeks. It commands an unobstructed view easterly towards Mounts Laussedat, Mummery and Freshfield, and northerly across the Bush valley towards the lofty Lyell, Bryce and Columbia groups. To the south and west lies Columbia river, with the monarchs of the Selkirks beyond.

Station xxviii is marked in the usual manner for primary triangulation stations with a brass bolt securely cemented in a hole drilled in the rock at the summit of the mountain. The head of the bolt is stamped with the Roman numerals xxviii, followed by a triangle with its apex at the centre of the head. The apex of the triangle faces north, and is the geodetic point.

As witnesses there were set in cement three iron bolts, each 6 feet horizontally from the geodetic point, and bearing respectively east, south and west from it. A conical stone cairn was built with the centre of its base directly over the geodetic point. Its dimensions are 6 feet in diameter at the base, 1 foot at the top and 7 feet 6 inches high. White cotton was wound around and securely wired to the cairn to serve as a signal.

Mosquitoes were very troublesome at Donald and all through Bluewater and Blackwater valleys, although at the lake we had a short respite from their onslaughts on account of the light breeze which generally blows down the lake. There is some excellent timber in Bluewater, Blackwater and Waitabit valleys, most of which is under license; there is also a quantity of low grade galena and copper ores.

STATION XXIX (BUSH RIVER).

From Blackwater lake the main trail continues for two and one-half miles to a low swampy pass (altitude 3,150 feet) and there swings to the easterly side of several small beaver lakes which form the headwaters of Succour creek, flowing northwesterly. For 11 miles the trail follows the right bank of Succour creek, finally striking Bush river crossing about a mile and a half in a straight line from the mouth of that river. This point may also be conveniently reached in canoes by descending Columbia river from Beaver mouth.

Bush river empties into the Columbia from the east, about 22 miles below Beaver mouth railway station. It is a glacial stream some 200 feet wide near its mouth, flowing at the rate of three and a half miles an hour. During the months of July and August the river carries an immense quantity of water, being fed by the large glaciers of Freshfield, Lyell, and Bryce groups. For a distance of three miles from its mouth the river flows in a westerly direction through low flat lands, which are mostly inundated during July and August by the high waters of the Columbia and Bush rivers. Higher up Bush river runs from the northeast with numerous side-channels flowing through shingle flats; the valley is about half a mile wide and the slopes of the mountain on each side are covered with dense spruce and fir timber. Bush river is navigable with canoes and small boats for a distance of 30 miles, although during the upper 20 miles poling must be resorted to, as the current from the mouth of Chatter creek (locally called Callahan creek) to the forks of Bush river is nearly five miles an hour. The whole of Bush river almost to the forks lies within the Railway Belt.

Owing to the low inundated lands of the Columbia valley near the mouth of Bush river, and the numerous hay meadows and lakes up Bush valley, this vicinity is scourged with mosquitoes and black flies during the greater part of the summer Messrs. Collie and Stutfield, who explored this district during 1900 thus describe it in their book "Climbs and Explorations in the Canadian Rockies" : "The weather was now very hot and sultry, and that evening swarms of the most voracious mosquitoes we ever encountered drove us nearly crazy. The men said they had occasionally seen them more numerous on the prairie, but that never in their lives had they known them anything so vicious or venomous. They lost no time in buzzing or fooling around, but went straight to business with their beaks until our faces and hands were one mass of bites . . . The night was a night of unending torment for, at this lower elevation (about 2,500 feet), the insects do not go to sleep after sundown, as in the higher regions of the eastern Rockies."

On the north side of Bush river near the crossing are two lakes, each about half a mile long, which I have named Cygnus lakes from the white swans that are generally to be seen upon them. These lakes are also the haunts of wild duck and geese in the autumn and, besides, teem with magnificent salmon trout, which are easily caught. In the river itself, charr, ling, and squaw fish are found. Black bears are plentiful along Bush river, and goat on the mountains; a few marten, wolverine, coyote, lynx, caribou and white-tailed deer may also be found. There is no mineral of any account in this vicinity. It would be desirable to establish the limit of the Railway Belt up Bush river, on account of the valuable timber in the valley, and along the tributaries of the river, for at present there is great uncertainty amongst timber cruisers as to the exact position of the Belt boundary.

Station xxix (Bush river) was established near the north limit of the Railway Belt on the summit of a mountain distant about 4 miles of Bush river crossing. We placed our camp on the south side of the river at the crossing, where we found an old galvanized iron boat, which had been placed there by the Provincial Government for the convenience of travellers on trail. Crossing the river we set out with instruments and packs up a hog's back between the two Cygnus lakes. At timber line we set a fly-camp, and the next morning (September 24) we finished the ascent to the desired peak. The station was marked in the usual manner with a brass bolt cemented in a hole drilled in the rock. The flat head of the bolt was stamped with the Roman numerals xxix, followed by a triangle with its apex at the centre of the head of the bolt. The apex of the triangle faces north and is the geodetic point. Four reference bolts were also securely cemented in the rock, each being distant 6 feet horizontally from the geodetic point, and bearing respectively north, south, east and west from it. Directly over the brass bolt a conical stone cairn was erected 6 feet in diameter at the base, 1 foot at top, and 9 feet high. The top of the cairn is vertically above the geodetic point. White cotton was wound around and securely wired to the cairn to assist as a signal. From station xxix a magnificent view is obtained to the north and east of those grand mountains of the main range, Mounts Columbia, Bryce, Alexandra, Lyell, Bush peak, Forbes, Freshfield and Mummery.

STATION XXIV.

During the season of 1906 a visit was made up Battle creek, a confluent of Incomappleux river, to establish station xxiv, near where Mr. W. S. Drewry had set his "Battle Creek" cairn in 1892; but it was found that no suitable location could be obtained to connect with station xxi (Spillimacheen) and station xxii (North Fork). I decided therefore that any attempt to extend the system of triangles across the summit of the Selkirks by sighting through a gap or gaps between the mountains would be futile, and that it would be necessary to fix station xxiv on one of the summit peaks of the Selkirk range. Sugarloaf mountain was accordingly picked out as a desirable location, and a trip was made up the valley of Beaver river in order to ascend that mountain.

The horses and outfit were shipped from Donald to Bear creek by rail, as there is no trail between these points, the railway here crossing many streams and rivers by some of the highest arches along the line. Bear Creek railway station is a flag station at an elevation of 3,670 feet, clinging to the side of the Hermit mountains along which the railway winds as it approaches Rogers pass. Some pickings of grass may be foraged along the railway track, but it is a dangerous spot for horses, it being necessary to herd the animals carefully in the day time, and tie them up at night to prevent accidents from passing trains. Consequently an immediate start was made from Bear Creek station (August 2), down the pack trail which leads to Beaver river, 800 feet below. About a mile and a half from the railway the trail crosses Beaver river by a bridge, then follows up the right (or east) bank of the river for a couple of miles, where it makes a turn up the north side of Grizzly creek. Here the trail branches, one fork ascending Grizzly creek to connect with the north fork of the Spillimacheen river, while the right-hand trail crosses Grizzly creek by means of a bridge and ascends Beaver valley. The trail runs in a southeasterly direction along the east side of the river for about 23 miles to the head of the river, and crosses a low pass (altitude 4,700 feet) into the valley of the Duncan. Beaver trail is now in bad condition, being littered with windfalls necessitating the constant use of axes in order to make it passable for the pack horses. About 6 miles from the Grizzly bridge the first swamp or meadow is reached, where feed may be obtained for horses, then during the remainder of the distance there are many swamps and meadows which, however, at high water make the trail very disagreeable for travelling, and it is an open question which is the worst, the swamps or the windfall.

As progress is made along the Beaver valley, openings in the dense forest allow occasional glimpses of the black and white precipitous mountains which line the western side of the valley. These rise to a height of over 10,000 feet, and there sheer dark masses form the easterly confines of the extensive Illecillewaet and Deville névés; and I may add that this view of mount Sir Donald and the other majestic peaks of the Selkirks is much grander than that seen from the Canadian Pacific railway on the western slope. On the left or easterly side of Beaver valley, Bald mountain lifts its long undulating height scarcely above timber-line.

Beaver river, which rages and races through canyons and rapids in its lower reaches, soon becomes much smaller as its many glacial feeders are passed, until at the summit between mount Beaver and mount Duncan, the river commences its flow from the broad Beaver glacier, which extends its tongue into the very valley. Here, too, from the Duncan glacier, only a short distance beyond, Duncan river takes its rise, flowing southward. About 3 miles from the pass or about 23 miles from Bear Creek railway station, one of the largest confluent of Beaver river enters from the west, being a stream about 15 feet wide and only a mile long, coming from the enormous Grand glaciers, which lie in the cold bosoms of Sugarloaf and Grand mountains.

Although Sugarloaf mountain seems to lie quite close to the pass, it is more easily reached via Grand glacier. Consequently we pitched our main camp on the bank of Beaver river and, taking instruments and packs, ascended the south branch of Grand glacier to an altitude of 6,800 feet, where we bivouacked on a small timbered slope beside the glacier. The following morning we ascended the glacier to an altitude of 9,000 feet, making only slow progress over its rough icy surface and around its many wide crevasses. After climbing steadily for several hours the morning turned cloudy and fine rain and sleet commenced to fall. We soon realized that further advance would be but a waste of time so returned disheartened to our fly-camp. Then followed five days of steady rain, during which time the whole vicinity was shrouded with dense clouds, and we were never able to discern objects more than a hundred yards away. On August 19 it began to clear, so the following morning before daybreak we once more attempted Sugarloaf. This time, however, instead of ascending the glacier we stuck to the rocky cliffs leading directly to the desired peak. After a steady but by no means difficult climb of six hours, almost entirely over ice

and snow, we reached the summit (altitude 10,700 feet). A temporary cairn was erected for station xxiv, but we could not set the permanent brass bolt on account of the depth of the snow. The descent to our fly-camp was made in four hours, with many exciting glissades down almost precipitous snow fields. The next day we returned to our main camp in the Beaver valley.

Although the geographical position of Sugarloaf mountain is a good one for a triangulation station, it is not a perfect location by any means. Owing to the heavy precipitation in this locality, and the consequent enormous areas of ice and snow, glaciers and névés it is only on rare occasions that a perfectly clear day can be obtained for observing and reading the angles necessary for triangulation work; while signals set on peaks in this district are also but rarely visible from adjacent stations.

From our camp near Grand glacier we returned to Bear Creek station in two days, although the trip in had taken over four days. The whole trip occupied twenty-two days, of which eighteen were rainy.

There is some very fine timber up the Beaver and Duncan valleys, fir, spruce, cedar and hemlock. Large deposits of iron pyrites exist in the mountains on the west side; also some copper and traces of gold on the eastern side towards the head of Beaver valley. Game is somewhat plentiful, consisting of caribou, deer, marten, wolverine, and bear, while goats are numerous on the mountains to the west.

STATION xxx.

That portion of the Railway Belt which lies north of Beavermouth and west of Columbia river had never, up to this time, been explored or mapped, so a visit was made into this district to establish triangulation stations and at the same time to prepare a topographical map of the country by means of triangulation, photography and track surveys.

Start was made from the Sixmile Creek railway siding, where the united north and south branches of Sixmile creek enter Beaver river from the west, about four miles from the mouth of the latter. Both branches of Sixmile creek flow rapidly through narrow valleys between the mountains, and a route up either stream is impracticable for horses. Several years ago a prospector made a trail up the north branch for several miles, in order to tap some rich mica deposits which he had located and staked there, but nearly all traces of the trail have been obliterated by slides and fallen timber.

Between Columbia river and the north branch of Sixmile creek a long ridge extends from the northwest, its southerly hog's back reaching in a point to the siding at Sixmile creek (altitude, 2,600 feet). This ridge was swept by fire several years ago, and it now stands grey and black with the burnt remnants of once valuable timber. Up this long hog's back we cut our way through débris and brulé, the horses with light packs following slowly up the steep incline. After advancing in a northerly direction for about 3 miles an elevation of 6,000 feet was attained, and here the going was comparatively easy through the sparse timber and undergrowth of this altitude. Camp was pitched on a pleasant spot where the first water was found, the horses finding plenty of grass in these highlands. We continued our advance in a northeasterly direction through narrow passes at timber-line, then along the level ridge, termed "The Esplanade," on the westerly slope of the Esplanade range, lying between Sixmile creek and Columbia river. On our left the north branch of Sixmile creek lay several thousand feet below, while beyond rose some of the highest peaks of the Selkirks: Iconoclast, Sorcerer, Seraph, Cherub, Ventego and Pearce.

A secondary station xxxA was established on a peak of the Esplanade range, Cupola mountain, so called on account of the shape of its rocky summit. Angles were read, photographs were taken, and other information derived for topographical purposes. Advance was continued along the easterly slope of the north branch of Sixmile creek, and a gradual descent made to the head-waters of that stream, where we crossed a narrow snow pass and reached the head of Spinster creek flowing northerly

into Gold creek. From the pass we advanced for about a mile, dropping down several hundred feet, and pitched camp beside a small alpine lake (Sunbeam lake).

Secondary station xxxB was established on Sentry mountain (altitude, 7,500 feet), which is the most northerly mountain of the Esplanade range, and overlooks the mouth of Gold creek and Bush River valley.

From station xxviii (Blackwater) and subsequently from Sentry and Cupola mountains, a high mountain since named mount Sandford, has been picked out as an excellent position for primary station xxx. This mountain lies near the north limit of the Railway Belt, in township 31, range 28, west of the 5th meridian, and is situated between Gold creek and Novelist creek. To reach this mountain, we therefore took packs on our backs (horses being of no further use), and crossed over a range of mountains to the west of our camp. We then descended some 4,000 feet into the valley of Bachelor brook or south branch of Gold creek, a rapid mountain stream about 30 feet wide. This creek flows through a narrow valley from the southwest and obtains its water from snow and ice in the very heart of the Selkirks, and empties into the main branch of Gold creek, about 15 miles from the mouth of the latter. We made a difficult crossing over the swiftly-flowing Bachelor brook, by means of an improvised foot bridge, and finding that progress was extremely slow through the dense timber along the banks of the creek, we ascended to timber-line of Sonata mountain, the mountain lying between Bachelor brook and Gold creek. From Sonata mountain we soon discovered that we were still a long way from mount Sandford, and that that mountain, alas, was covered with fresh snow. We established a secondary station, xxx C, on Sonata mountain (9,000 feet) then returned to our main camp, after an absence of five days, during three of which it had rained. A heavy snowstorm now set in, which covered the whole district with nearly a foot of snow, so we returned to the railway at Sixmile Creek siding. A topographical map of that part of the Railway Belt in the vicinity of Gold creek and Sixmile creek has been prepared, with names for the important mountains and streams.

Gold creek enters Columbia river from the west, near the mouth of Bush river, and is a rapid glacial stream which, during the months of July, August and September, carries an immense volume of water. Although a reconnaissance was made up Gold creek at the time of the preliminary surveys for the Canadian Pacific railway, no trail exists up the valley, which is at present impracticable for horses. There is much valuable timber up Gold creek, and its many confluent which has not yet been taken up. There is very little mineral of value in the vicinity, despite the suggestive name of the stream. Rich deposits of amber and white mica exist all through the Selkirks from Sixmile creek to the "big bend," and although some claims have been staked and recorded, the mines have not been developed.

NOTES ON THE WEATHER.

The winter of 1906-7 which was such a severe one all over Canada was none the less so in the Rocky and Selkirk mountains, and the snowfall was especially heavy. The spring, too, was late, and even in the last week of June the snow still lingered below timber-line. It was not until after the first week in July that the higher peaks became at all free from their many feet of snow, so that the cairns and signals of the triangulation survey were visible. After such a winter it was of course expected by all that the summer would make amends, but in this we were greatly disappointed. Some very warm weather was experienced, it is true, but on the whole the summer was the wettest for many years, the only compensation being the lack of forest fires which are generally such a curse, especially during the month of August. The mosquito pest was worse than usual, and we were troubled with that scourge from June until the end of September. Of course it must be realized that weather conditions are often judged from different viewpoints, and that many days which are termed "cloudy" by a mountain surveyor, are called "fair" by residents of the valleys, for the clouds which obscure the mountain peaks and the surveyor's signals serve to make the days more pleasant to the sojourners in the valley.

During the latter half of June in Columbia valley there were nine fair days (all of which were very warm and sultry), one cloudy day, and five days of rain. In the month of July, in Columbia, Blaeberry and Blackwater valleys, we had fifteen fair, two cloudy and fourteen rainy days. In August in Beaver valley it rained on twenty-one days (with snow on the peaks) and of the remaining days six were fair and four cloudy. During September, in the valley of Gold creek, and the vicinity of Bush river, thirteen days were fair, three cloudy and fourteen rainy, with some heavy snowfalls even at the low altitude of 5,000 feet. The month of October was exceptionally fine in Columbia valley, being free from severe storms, and very little snowfall on the mountains. Although the reports on the weather give only four rainy and five cloudy days, the conditions were not suited to triangulation work. A heavy mist obscured the whole valley and the neighbouring mountains every morning, and it was unaffected by the rays of the sun until nearly eleven o'clock at which hour the banks of fog lifted only to cling tenaciously to the cold mountains. Then at four in the afternoon, as the sun settled below the western hills, the mist descended once more in a dense mass.

The water in Columbia river during the summer months was lower than usual, which goes to show that the amount of extreme heat, especially in the early summer, was less than in other years.

GENERAL NOTES.

The west boundary of Yoho Park reserve has recently been altered by Order in Council, and instead of following the meridian between ranges 19 and 20, west of the 5th meridian, from the summit of the Beaverfoot range to the south limit of the Railway Belt, it now runs southeasterly along the summit of the said range of mountains to the limit of the Belt. This change throws open to settlers a goodly portion of fruit and farming lands, and already advantage has been taken of it by homesteaders and purchasers. At present only the bottom lands in the Columbia valley are at all under cultivation, and but few attempts have been made to thoroughly test the possibilities of this district for producing the hardy and small fruits, although the results of most endeavours have been eminently satisfactory. Besides the bottom lands, however, there is a large area of excellent bench lands suitable for fruit farms extending back to the main mountains, but these lands will need considerable clearing, a task, however, which seems to require more energy than the easy-going ranchers of the valley have at their disposal. A great portion of the said bench lands is comprised within timber berths which have been stripped of their best timber, except that suitable only for railway ties. Should these lands be desired at any time for farming purposes they could be expropriated from the timber berths without any serious loss to the lumber companies. However, until the much-delayed Kootenay Central branch of the Canadian Pacific railway is constructed there will be very little activity in this district, either in agriculture or mining.

P. A. Carson, D.L.S., 1908.—Spillimacheen, Blaeberry, Storm Mt., Mt. McArthur, Mt. King, Mt. Cherub, Bush River Forks, Bush River, Blackwater, etc.

SIR,—I have the honour to submit the following report of my field operations on the triangulation in British Columbia, in connection with the Trigonometrical Section of the Topographical Survey of Canada, for the season of 1908. This report should be read in conjunction with my annual reports for the years 1906 and 1907.

Information having reached me early in the spring of 1908 that the winter in the Rocky and Selkirk mountains had been exceptionally mild, I decided to leave for the field earlier than usual. Consequently I set out from Ottawa for the west on May 23, a fortnight earlier than on the previous season. On arriving in the mountains, however, I discovered that although the snowfall had been rather less than the average,

the spring, especially during the month of May, had been backward, and in the higher elevations of the mountain slopes and in those spots unexposed to the sun the snow had not melted very rapidly.

At Golden, B.C., where I had stored my outfit the previous autumn, I made up my party of five men, and was fortunate in again securing the services of my cook and packer of the previous season. Of the eight pack horses which wintered in the Columbia valley, twenty-nine miles south of Golden, one had died in the early spring, but the others were all in excellent condition.

I first visited the base line in the Columbia valley, twenty miles south of Golden, and took a series of observations for azimuth with the astronomical transit, by observing on a programme of time and azimuth stars, according to the method described in Hayford's 'Geodetic Astronomy,' except that instead of one azimuth star two were observed in each half set or group. The terrestrial azimuth mark used was a lantern with a small slit, one inch in vertical height, and one-third inch wide, at a distance of one mile. The calculations were made according to Hayford's method of approximation without the use of least squares. Although this method of determining azimuths is one capable of great refinement and accuracy its use in a triangulation of a secondary character is scarcely justified, on account of the cumbersome nature of the astronomical transit, the difficulty in placing a distant terrestrial azimuth signal, the time spent in actual observing, and the lengthy reduction calculations, either with or without the use of least squares. Azimuths of the same degree of accuracy as the rest of the triangulation can easily be obtained by taking a series of observations on Polaris with the ordinary triangulation theodolite, provided the instrument will permit the telescope to rotate to a sufficiently high altitude.

Stations 'A' and 'B,' at the ends of the base line were occupied; also station 'C,' 'D' and 'E,' for the projection of the base to the main triangulation; and station 'XX.' (Beaverfoot) of the main system. At stations 'C' (elevation 8,007 feet) and 'XX.' (elevation 7,940 feet), on the Beaverfoot range, on June 24 the snow was still several feet deep, even below timber line.

STATION XXI. (SPILLIMACHEEN).

From June 28 to July 6, I made a trip up the middle fork of Spillimacheen river, via Carbonate Landing, Summit lake, and the middle fork trail, advancing up the valley of the middle fork to Spruce camp (elevation 5,500 feet), about four miles from the head of the stream, and near the south limit of the railway belt. The trail up the valley was in fairly good condition, although it is now seldom used, the numerous mining prospects in this district having never been developed. There is good grass for horses along the upper portion of the trail on the many slides from the mountains.

I established and read angles at station 'XXI.' (Spillimacheen) and the secondary stations 'XXI. A' and 'XXI. B' on the peaks lying between the middle and north forks. Station 'XXI.' is situated on the sharp peak of the highest mountain of this range, at an elevation of 9,410 feet. The station is marked in a permanent manner by means of a brass bolt six inches long and three-quarters of an inch in diameter with a flat head one and one-half inches square, and one-half inch thick. This bolt is set in a hole drilled in the solid rock, and firmly fixed by cement. The head of the bolt is stamped with the Roman numerals 'XXI.', followed by a triangle \triangle ; the apex of the triangle faces north at the centre of the head of the bolt, and is the geodetic point. As reference points, two holes, one inch in diameter were drilled in the rock. The reference points are each six feet distant from the geodetic point, and bear respectively south and west from it. Directly over the brass bolt a conical stone cairn was erected, four feet in diameter at the base and six feet high. The top of the cairn is vertically above the geodetic point. A band of white cotton was wound around the cairn, about a foot from the top, to assist as a signal. The ascent

to station 'XXI.' was rather difficult as we did not discover the easiest route until we commenced to descend. While on the summit a severe electrical storm took place, somewhat similar to the one on Mt. Kapristo (station 'E') in 1907.

Station 'XXI. B' is situated on a lower peak (elevation 8,825 feet) about two miles east of station 'XXI.' The station is marked only by a conical stone cairn eight feet high.

Station 'XXI. A,' which was established by Mr. W. S. Drewry in 1891, is situated about a mile east of station 'XXI. B,' on the most easterly mountain of the range, being between the middle and north forks of Spillimacheen river. The station is marked only by a conical stone cairn, seven feet high, the brass bolt placed here in 1906 having been moved to the present location of primary station 'XXI.'

A reference station was also placed in the middle fork valley, being a spruce post, six inches square, and three feet long, marked 'station XXI. C,' and angles were read to and from stations 'XXI.' and 'XXI. B.' From the positions of these stations the location of this reference post has been calculated, and may be used for commencing new surveys, or tying in mineral claims, etc., the Dominion system of surveys not having been extended to this vicinity.

During our trip up the Spillimacheen it rained on four of the ten days. On returning to Carbonate Landing we met a party of American college tourists, above twenty-five strong, both men and women, who were spending a month in the mountains ostensibly for the purpose of making a scientific study of the geology, mineralogy and botany of the district. Each year sees the Canadian Rockies becoming more and more popular as a great playground and field for students of nature.

STATION XIX. A (BLAEBERRY).

It was deemed desirable to establish a triangulation station up the Blaeberry valley near the north limit of the railway belt. Consequently on July 15 a start was made from Golden up the Blaeberry pack trail. We went about thirty miles up the river, the first half of the journey being along the timbered eastern slopes of the valley, past the Blaeberry falls and canyon, and the latter half along the wide gravel bars of the river, with frequent fordings of the main river and its numerous channels.

In the Blaeberry valley there is some of the finest timber I have ever seen, spruce, fir and some cedar, most of which is under license. Game is somewhat plentiful, bear (both black and grizzly), goat, deer, and marten, while small trout may be caught at the mouths of the small streams flowing into the Blaeberry.

We camped near the mouth of Mummery creek, a glacial stream about thirty feet wide, flowing from the west from Mummery glacier three miles back. The point is about three-quarters of a mile south of the north limit of the railway belt. The mountain on which station 'XIX. A' is situated is a prominent peak (elevation 10,000 feet), three miles immediately east of Mt. Mummery. At its base Blaeberry river takes a sharp turn from the east, and when approaching up the valley towards the north limit of the railway belt the mountain seems to suddenly terminate the valley. The ascent to station 'XIX. A' was made via Mummery creek and glacier, up the westerly slope of the mountain, the apparently easier approach up the southerly ridge being broken by rock cuts and gulches, as we learned to our sorrow on attempting the descent by that route, being forced to spend a cold, hungry night on the rocks. The station was not placed on the highest peak, which is rather too far back to the north, but was established on the peak visible from the valley (elevation 9,620 feet).

Station 'XIX. A' is marked with the usual brass bolt set in a hole drilled in the rock, and firmly fixed by cement. The head of the bolt is stamped with the number of the station, viz., 'XIX. A', followed by a triangle '△'; the apex of the triangle faces north at the centre of the head of the bolt, and is the geodetic point. As reference points for determining the position of the permanent mark at any time there

were placed two iron bolts firmly fixed by cement in holes drilled in the rock, one bolt being six feet distant from the geodetic point and bearing due north from it and the other bolt five feet from the geodetic point and bearing due east from it. A conical stone cairn was erected directly over the brass bolt, being four feet in diameter at the base and six feet six inches high. The top of the cairn is vertically above the geodetic point. A band of white cotton was wound around the cairn about a foot from the top to assist as a signal.

Connection was made between station 'XIX. A' and a wooden post marking the northwest corner of timber berth No. 415, on the east or left bank of Blaeberry river; which post is supposed to be on the north limit of the railway belt. A base line one mile in length was established along the gravel bars of the river, and was connected to the said post of the timber berth by means of a traverse. The base line was projected to the station 'XIX. A' by means of two secondary stations.

We then returned along the Blaeberry trail and made an ascent to station 'XIX.' on Mt. Laussedat (elevation 10,000 feet) and read angles there on stations 'XIX. A' 'XVIII.', 'XVII. E,' 'XXII.', 'XXIII.', 'XXVIII,' and 'XXX A.' The ascent of Mt. Laussedat makes a very interesting climb, but after our experience of the previous year, no great difficulty was encountered. While observing on the summit I suffered intensely from the cold.

From Mt. Laussedat we returned to Golden on July 29th, the whole trip up the Blaeberry occupying fifteen days, on seven of which it rained. The remaining days were clear and sunny, with excessive heat in the middle of the day.

STATION XIV. (STORM MT.)

From Golden I shipped the horses and outfit to Castle Mountain railway station, in order to occupy station 'XIV.,' situated on Storm Mt. (elevation 10,300 feet) on the summit of the main range of the Rockies. On account of the tunnelling and other work being carried on by the Canadian Pacific Railway company in the Kicking Horse pass, the old tote road from Field to Laggan is now impassable for horses, and it is necessary to ship by rail between these points. A full account of the trip to station 'XIV.' was given in my report for 1906, and it will be unnecessary to repeat a description here. The ascent on this occasion was much easier than in 1906, and conditions more favourable for observing on account of the absence of snow on the peak in August.

Fierce forest fires raged in the early part of August in the vicinity of Banff, about the time the disastrous Fernie fires occurred. Fortunately for the triangulation work the prevailing west wind kept the smoke from advancing westward, although the mountains to the east were completely obscured by a thick pall.

STATION XVIII. (MT. MCARTHUR.)

Station 'XVIII.,' on the summit of Mt. McArthur (elevation 9,882 feet) was next visited, via Emerald lake wagon road, Yoho pass, and the upper Yoho pack trail. From the high elevation of our camp on Little Yoho river (over 6,500 feet) an easy ascent was made to station 'XVIII.,' and angles were read under favourable conditions. The return to Field was made in one day. The weather was all that could be desired during our trip up the Yoho, which lasted five days.

STATION XVII. (MT. KING).

This station is on the summit of Mt. King (elevation 9,456 feet) in the Van Horne range. A detailed account of how to reach Mt. King from Field is given in my annual report of 1906. During the occupation of this station the weather was favourable for observing, and angles were read on stations 'XIV.,' 'XX.,' 'C,' 'E,' 'XXI.,' 'XXI. A,' 'XXI. B,' 'XXII.,' 'XIX.,' 'XIX. A.' and 'XVIII.'

On returning to Field the horses and outfit were shipped to Sixmile Creek railway siding.

STATION XXX. (CHERUB MT.)

From the Sixmile Creek railway siding (elevation 2,600 feet) we ascended the gradual slope of a long ridge covered with brulé and fallen timber, which extends from a northwesterly direction towards Sixmile Creek siding. We attained an elevation of 6,000 feet after a three hours' steady pull for a distance of three miles; thence advance was made through the sparse timber, past a couple of small alpine lakes forming the headwaters of streams flowing into Columbia river. Continuing in a northwesterly direction we went through a pass at timber line, then along 'The Esplanade' to Sixmile Creek pass, dropping down to Sunbeam lake (elevation 6,700 feet) at the head of Spinster creek, which flows northerly into Gold Creek.

During the spring and early summer a party of men engaged by a syndicate from Ohio were employed in cutting trail from Sixmile Creek siding up the north branch of Sixmile creek to some mica claims situated several miles from the mouth of Comedy creek, a confluent of the said north branch from the west. Rich deposits of excellent white mica exist all through the Selkirks from Sixmile to the Big Bend, and there now seems to be some prospect of these claims being developed. The above mentioned trail was impracticable for horses, however, although in future this route will be the better one to reach Cherub Mt., on which station 'XXX.' is situated.

As far as location is concerned, Mt. Sir Sandford (elevation 11,600 feet), the highest peak in the Selkirks, is a most admirable situation for a triangulation station, and I had proposed to place station 'XXX.' on its summit. This mountain is at present the mecca of all alpine pilgrims in Canada, but at the close of the year 1908 all worship at its shrine had been done from afar. During 1908 two parties of aspiring alpinists attacked this majestic mountain, only to be repulsed before reaching the main peak. Sir Sandford's magnificent hoary summit rises over a thousand feet above all neighbouring mountains, and is the most conspicuous feature in this large district of prominent and majestic mountains. From the viewpoint of an alpine climber, the victorious ascent of Mt. Sir Sandford will be an honourable feat, but for a triangulation or topographical surveyor a snowless and more easily accessible mountain is the goal to be sought.

Station 'XXX.' was finally established on Cherub Mt. (elevation 9,740 feet), lying between the north branch of Sixmile creek and Bachelor creek, being about three miles westerly from our camp at Sunbeam lake. The ascent of Cherub Mt. is by no means a difficult one, except for the wide névés and glaciers which must be crossed.

Station 'XXX.' was marked in a permanent manner by the usual brass bolt set in a hole drilled in the rock and fixed by cement. The flat top of the bolt was stamped with the Roman numerals 'XXX.' followed by a triangle, '△.' The apex of the triangle faces north at the centre of the head of the bolt and is the geodetic point. As reference marks there were set two iron bolts cemented in holes drilled in the rock. One bolt is due north of the geodetic point and distant five feet from it; the other is due east and distant six feet from the geodetic point. A conical stone cairn was built directly over the brass bolt, with its pointed top vertically above the geodetic point. The cairn is five feet in diameter at the base, and eight feet high. A band of white cotton was wound around the cairn to assist as a signal.

Besides station 'XXX.' in this vicinity I also established five secondary stations on mountain peaks. These are station 'XXX. A' (Cupola Mt.) elevation 8,625 feet; station 'XXX. B' (Sentry Mt.) elevation 8,320 feet; station 'XXX. C' (Sonata Mt.), elevation 9,830 feet; station 'XXX. D,' elevation 8,467 feet, and station 'XXX. E,' elevation 8,453 feet. On account of the rough nature of the country in the vicinity of Sixmile creek and Gold creek, the valleys being very narrow and the elevations of

the streams and passes extremely high, it is not at all probable that the Dominion system of surveys by means of section lines will ever be extended into this district. Consequently these triangulation stations should prove very useful for locating and tying surveys of mineral claims or timber berths.

From August 1 to 17 we had enjoyed almost perfect weather, with no steady rains, as in August, 1907. From the 18th to the 22nd the air became hazy with the dense smoke from the bush fires, rendering the mountain peaks almost invisible. On August 23 rain commenced to fall, and for eight days it rained and snowed without ceasing. From my experience in the Selkirks it would seem that each year there is a prolonged rainstorm, with snow on the mountains about the third week in August.

STATION XXIX. (BUSH RIVER FORKS.)

On returning to Sixmile Creek siding the horses and outfit were shipped to Donald, and we travelled to Bush river by the trail which leads from Donald to the Big Bend and Tete Jaune Cache. This trail had been repaired and cut out by the provincial authorities in the early summer and was in excellent condition. We crossed Bush river at the old crossing in a boat, the horses swimming the stream. The water in the river was considerably lower than at the same date of the previous year. We then moved by pack train along the north or right bank of Bush river, first following the shore of Upper Cygnus lake for a distance of two miles, then making our way along the bank of the river. On the whole there was very little cutting to do as we were able in many places to travel along the gravelly beach; and only when we came to sharp turns in the river were we obliged to do any heavy cutting. The most serious obstruction encountered was a rocky bluff some forty feet high abutting a rapid and deep part of the river. Over the top of this bluff we were forced to cut a trail, and we resumed progress after two hours' delay. By night we had advanced ten miles up the river, although prospectors and trappers had informed me that I could not get a pack train through. On the second day the going was even better, along the wide gravel bars of the river, which runs in several channels, in a general southwesterly direction. By repeated fordings we easily made the nine miles to the forks of Bush river (elevation only 2,500 feet). Here the gravel bars ceased, the river below the forks running swiftly in one narrow channel, with a six-foot fall in one place. Except for a short portage around this fall, Bush river is navigable for canoes and small boats, the current running at about three and one-half miles per hour. Boats may also be used for several miles up the north fork.

This fork of Bush river which carries fully two-thirds of the water of the river comes from almost due north, and with its many confluent rises in the very heart of the main range of the Rockies, and obtains its waters from the huge ice-fields of the Columbia, Bryce and Lyell groups. The south fork is a narrow stream, about thirty feet wide at its mouth, and comes roaring from the southeast through narrow canyons over which it is almost possible for a man to jump. About a mile from the forks there is a fine fall of nearly twenty feet. The south fork drains the western slope of the Freshfield group.

Station 'XXIX. A' was established on Yellow mountain (elevation 8,178 feet) lying immediately east of the forks, and commanding an unobstructed view down Bush river. The station was marked in a permanent manner with the customary brass bolt, set in a hole drilled in the rock and fixed by cement. The head of the bolt is stamped with the number of the station 'XXIX. A' followed by a triangle, '△.' The apex of the triangle faces to the north at the centre of the head of the bolt, and is the geodetic point. Three iron reference bolts were also cemented in holes drilled in the rock. Each bolt is distant six feet from the geodetic point, and they bear east, south, and west respectively from it. Directly over the brass bolt a conical stone cairn was built, five feet in diameter at the base and seven feet high. The top of the cairn is

vertically above the geodetic point. A band of white cotton was wound around the cairn about a foot from the top to serve as a signal.

The ascent of Yellow mountain was made by going up the bank of the south fork for a mile and a half and then climbing the southwesterly slope of the mountain through *brulé* and windfall. No hard climbing was encountered, but we were without water for twelve hours. From Yellow mountain a magnificent view is obtained of some of the loftiest peaks on the summit of the Rockies—Freshfield, Lyell, Alexandria, Bryce and Columbia.

I also established a reference station in Bush Valley (elevation 2,500 feet), on the right or north bank of the river, about a mile and a half below the forks. This station is marked by a cedar post five inches square and four feet long. The post is situated in a cleared space, ten feet from the bank of the river and eight feet above the level of the water. The post is marked 'Sta. XXIX. B' on one side and on another side 'Triangulation Survey in British Columbia.' From this station I observed angles on stations 'XXVIII.,' 'XXIX. A,' and 'XXX. B.'

The timber in the vicinity of Bush river forks is not very good, being mostly burnt. Game is plentiful, black and grizzly bear, goat, caribou, deer and marten. There are very few fish in the river, but in a small lake a mile below the forks, and lying between the river and the mountains to the south, we caught magnificent trout, some weighing fully five pounds.

The return to Bush river was easily made, the water being much lower than when we ascended the river. The trip occupied nine days, from September 13 to 21, on three of which it rained. Each morning a heavy mist filled the valley and was not dispersed by the sun until nearly eleven o'clock. The presence of this morning mist, however, I soon learned was an augury of a fine day.

STATION XXIX. (BUSH RIVER).

From Bush river crossing I again ascended to station 'XXIX.' (elevation 8,100 feet) and observed angles on stations 'XXIX. A,' 'XXVIII.,' 'XXIII.,' 'XXX. A,' 'XXX.,' 'XXX. B,' 'XXX. C,' and 'XXX. D.' Very disagreeable snowy weather overtook us for several days, from September 25 to 29, during our occupation of station 'XXIX.'

STATION XXVII. (BLACKWATER.)

Returning by the Donald trail, I branched off at Blackwater lake, and again visited station 'XXVIII' (elevation 8,940 feet), observing angles between stations 'XIX.,' 'XXIII.,' 'XXX. A,' 'XXX.,' 'XXX. D,' 'XXX. E,' 'XXX. B,' 'XXIX.,' 'XXIX. B,' and 'XXIX. A.' During the occupation of this station, October 3 and 4, we suffered from cold and snow, and the angle readings were made under very disagreeable conditions. At our flying camp near timber line of Blackwater mountain, a grizzly bear spent a night within a hundred feet of our tent, sniffing at the fire. He sprang up at our approach, and greatly to our relief, galloped off up the mountain side.

On our return to Donald, I sent the packer with the horses to their winter range, twenty-nine miles south of Golden, and shipped the outfit by rail to Ross Peak water tank, at the mouth of Cougar creek, in the Illecillewaet valley. There I made a survey connecting the Drumlummon and Skookum mineral claims to the Dominion system of surveys, for which survey I received instructions dated May 13. I also made a visit to the Nakimu caves, and under the guidance of Charles Deutschman explored some of the nethermost regions of those wonderful subterranean vaults. While I have no new theories to advance regarding the formation, age, or extent of the caves, it nevertheless seems to me, judging from the volume of water flowing in the subterranean torrent near 'The Turbine' and 'The Bridal Chamber,' and com-

paring it with the quantity which flows into the Illecillewaet via Cougar creek, that there must be some other undiscovered exit for the water, but in what direction I know not.

ANGLE READING.

The instrument used for observing angles at the triangulation stations is a direction theodolite, made from a special design by Messrs. T. Cooke and Sons, York, England. The telescope has a focal length of 15.5 inches, and the objective a clear aperture of 2 inches; the eyepiece mostly used has a magnifying power of thirty diameters. The 6-inch horizontal circle is graduated to 0.25 degrees, and the readings are made by two micrometer microscopes of high magnifying power, with two parallel vertical spider wires. Five revolutions of the micrometer correspond to one division of the horizontal circle, and therefore one revolution is equal to 0.05 degrees. The milled head of the micrometer is divided into fifty divisions, and therefore one division is equal to 0.001 degrees, or 3.6 seconds of arc. The observer can interpolate to parts of a division.

Horizontal angles are read by the direction method, in most cases closing again on the horizon. Four complete sets of readings are made, with telescope direct and reversed, and motion forward and back. Between each set the horizontal plate is shifted 45 degrees to minimize the effect of periodic errors of graduation. To obviate the necessity of determining the run of the micrometer screw, the pointing on the first station in each set is made to differ from the previous pointing on the same station by one revolution of the milled head. For example, if the reading on the first station in the first set be 0.00 degrees with 0 revolutions, the pointing on the same station for the second set is made 45.00 degrees with one revolution; for the third set 90.00 degrees with two revolutions; and for the fourth set 135.00 degrees with three revolutions. By this means the same part of the micrometer screw is used at each station, and run of the screw practically reduced to zero. Both forward and backward motions of the micrometer are read on the graduations of the horizontal circle adjacent to the centre of the comb scale, and the mean of the forward and backward readings taken, the discrepancy between them being supposed to result from error in bisection. By closing on the horizon accidental errors can be traced either to errors in pointing on the signals, or to accidental movement of the instrument during the observation.

In the majority of cases the simple triangles were adjusted by the ordinary method, although where a series took the form of a quadrilateral with the angles between the diagonals also read, the rigorous quadrilateral adjustment described by Johnson in his 'Theory and Practice of Surveying' (page 549) was used. This triangulation being merely of a secondary nature, and intended for practical purposes only, the refinements of primary triangulation have not been resorted to. The horizontal angles have not been reduced to what they would have been if the stations observed upon had been at sea-level, as the reduction is very small, and the calculations for the lengths of the sides of the triangles have been made for plane and not for spherical triangles.

The theodolite is mounted on a short tripod, about two feet high, rigidly braced with cross-pieces screwed to the legs and the metal-mounted points of the legs were set in small holes chiselled in the solid rock at the station. At stations where the instrument could not conveniently be set directly over the geodetic point the distance and direction from the instrument to the geodetic point were carefully measured, and the observed angles were reduced to the true centre.

Owing to the exposed nature of the mountain peaks on which nearly all the triangulation stations are situated, great difficulties to satisfactory observing are encountered. It is out of the question to erect elaborate shelters for observing, nor can heliotropes or night signals be used. The season for occupying stations of high

elevations is very short, and only a limited time can be spent in observing. Owing to the uncertainty of the weather the motto to be followed in most cases is 'carpe diem.' Early mornings or evenings are the best times for observing horizontal angles, but when from three to six hours of the morning are spent in ascending from timber line to the summit, and several hours must be held in reserve for the descent in the evening, the part of the day best suited for observing is thus lost, and angles must perforce be read when atmospheric disturbances are at their greatest. At the summits, too, it is well-nigh impossible to effectively protect the instrument from the sun and wind.

Before commencing to read the horizontal angles at any station it is advisable to look for each station to be observed upon, in order that no time should be lost in finding the signals during the actual observing. Rapidity of observing is an important factor when combined with careful setting, and as little time as possible should elapse during the reading of a set of angles. When, however, a signal is temporarily obscured by a passing cloud it is a momentous question to decide whether to omit the invisible station and go on with the rest of the set (afterwards to fill in that station), or to wait until the signal can be sighted upon and risk the probability of an accidental movement of the instrument.

The lengths of the sights in this triangulation are from fifteen to twenty-five miles, and with the telescope of the Cooke theodolite excellent bisections can be made upon conical stone cairns from six to eight feet high. When a cairn on a distant mountain peak stands against the sky-line the pointed top of the dark mass of the cairn can easily be sighted upon, but where pointing is made from a high to a lower mountain, and the distant cairn has a dark background, the assistance of a band of white cotton wound around the cairn about a foot from the top has been found most serviceable. Tin signals in the form of truncated cones placed on the top of the cairn have not been satisfactory. Only on rare occasions was reflected light received from these signals, and never from more than one at a time. The tin, too, becomes rusted after a season's exposure. With the cairns for signals no correction for phase is necessary.

By means of the attached vertical circle on the theodolite the elevations of the triangulation stations and other reference points were read at or shortly after noon, when the irregular effect of refraction is at a minimum. As simultaneous reciprocal observations cannot be made the calculations for height have to be made by the method of observations at one station only. No satisfactory determinations of high elevations were obtained by the use of aneroids.

GENERAL NOTES.

The winter of 1907-8 in the mountainous Kootenay district was fairly cold with an average amount of snow. The early spring was fine, but turned cold and wet during May. In the Columbia valley during the month of June the weather was changeable, eleven days being fair, sixteen days rainy, and three cloudy. The month of July was mostly fine in the Columbia and Blaeberry valleys, with sixteen fair days, four cloudy days and eleven days of rain, being mostly scattered showers. On the fine days intense heat prevailed in the middle of the day. August was an exceptionally dry month, especially when contrasted with the same month of 1907. Very little rain fell in the main range of the Rockies, and of the first sixteen days of the month thirteen were fair and three cloudy. The result of this fine weather, however, may be seen in the disastrous forest fires which occurred in the early part of August. In the Selkirks during the latter half of the month, six days were fair, eight rainy, and one day cloudy. On the fine days the smoke from bush fires was very troublesome. During September, in the Bush river valley, there were thirteen fair days, six cloudy and eleven days of rain. In October in the Illecillewaet valley of the Selkirks, cloudy

weather prevailed, with only nine fair days. Permanent snow fell at Glacier House about October 21.

The water of the main streams during the summer of 1908 rose only to an average level. The mosquito plague was as bad as usual, and seemed to begin earlier. We were fortunate in escaping the worst of that terrible scourge by a timely arrangement of our visits to the different localities. The crops in the Columbia valley in 1908 were fairly good, and fruit-growing is developing rapidly, although the small fruits do not ripen sufficiently early to catch the first market, probably on account of the high elevation of the lands throughout the Columbia valley (average elevation, 2,500 feet). The fruit, when at maturity, however, is large and of excellent flavour. There has been no recent mining activity of great moment in this district, unless the probable development of some mica properties in the Selkirks.

P. A. Carson, D.L.S., 1909.—Rosebery Mt., Carnes Mt., Mt. Cornice, Mt. Sorcerer, Grand Glacier, Spillimacheen, Bald Mt., etc.

SIR,—I have the honour to submit the following report of my field operations during the past season on the triangulation survey in the railway belt of British Columbia, in connection with the Trigonometrical section of the Topographical Survey of Canada.

I left Ottawa on June 8, for Golden, British Columbia, where I had stored my outfit the previous autumn, and after making up my party, I proceeded by rail to Revelstoke. Thence we went up Columbia river by trail to Carnes creek, a rapid mountain stream some twenty-five feet wide, flowing into the Columbia from the east about twenty-six miles above Revelstoke. The mouth of this creek is about a quarter of a mile north of the limit of the railway belt. Columbia river in this vicinity is very rapid, but is navigated by a wonderful flat-bottomed steamboat, which with enormous boilers and powerful machinery, manages to navigate the rapids and canyons. This boat plies from Revelstoke to Downie creek, a distance of forty-five miles, carrying supplies to the mines and lumber camps of that district. There is a wagon road from Revelstoke to Mosquito landing, a distance of six miles; then an old trail leads up the east side of the river to 'big bend.' This trail is not much used now and is in rather bad condition. There is some good timber, consisting of cedar, spruce, hemlock and fir, along both sides of the river, extending high up on the mountains. The low lands are suitable for fruit growing, but the clearing of it will be a herculean task on account of the heavy timber. The valley itself is rather narrow, with, however, some good bench lands higher up. The mountains on each side of the river are low, rising only to an elevation of six or seven thousand feet with higher peaks several miles back.

About four miles from its mouth Carnes creek divides into the north and south forks, the former coming from the direction of Standard basin and Downie creek, while the south fork, which lies wholly within the railway belt, heads from the same snow fields as Silver, Laforme and Clachnacudainn creeks. An old pack trail leads up to the north side of Carnes creek to the forks, crossing the northerly stream by a bridge and following the south fork for a distance of two miles to some undeveloped mining claims. A branch trail also ascends the west bank of the north fork towards Standard basin, while at the bridge a third trail climbs Rosebery mountain with numerous switchbacks to the old deserted Rosebery mine, at an elevation of six thousand feet.

I set two stations in this vicinity, one on Rosebery mountain (elevation 8,000 feet), and the other on Carnes mountain (elevation 8,000 feet), reading angles therefrom and taking photographs for mapping purposes.

A topographical map has been prepared of this mountainous district, extending northeasterly to connect with my map of the previous season.

From Carnes creek I returned to Revelstoke and moved to Twin Butte railway station, eleven miles east of Revelstoke. On account of the position of Albert peak, we were obliged to ascend to timber line with a light camping outfit, climbing from Twin Butte bridge up the ridge projecting between the railway and East Twin creek. If Lord Byron had made this trip through dirty windfall and burnt timber I am perfectly sure he would never have uttered that beautiful line 'There is a pleasure in the pathless woods.' From timber line we ascend North Albert peak, the summit of which on this date (July 9) was covered with deep snow. Station XXVII. was consequently placed on a projecting and adjoining creek slightly lower than the main summit at an elevation of 9,300 feet.

We next moved to Albert Canyon railway station, and followed the trail leading up the north fork of Illecillewaet river. This trail is the remnants of the sometime wagon road, fearfully and wonderfully made, leading to the defunct Waverley and Tangier mines, whose unlaidd ghosts still scare nervous capital from British Columbia. We advanced fifteen miles up the river to 'the farm,' from where we ascended Cornice mountain (elevation 9,000 feet) and occupied station XXVI. During the descent of this mountain we encountered four caribou, two black bears and a huge grizzly within the space of half an hour.

From 'the farm' we proceeded for twelve miles up the old wagon road, which follows the east or left side of the river, until we reached a broad level pass (elevation 5,700 feet) between the heads of the north fork of Illecillewaet river and Downie creek. On the Downie slope, about a thousand feet below the pass, lay the old deserted buildings of the Waverley and Tangier mines, now frequented only by legions of porcupines.

On the summit of Sorcerer mountain (elevation 10,500 feet), which lies on the northeasterly side of the pass, I established station XXXI. This mountain is one of the most commanding peaks in this locality, and is rather difficult to scale. On account of the depth of snow on the summit, I was unable to cement the brass bolt in the rock, but I placed it temporarily in the centre of the cairn.

On the flat pass I ran a base line sixty-eight chains long, and by means of three secondary stations connected station XXXI. with one of the survey posts of the Tangier group, thus locating the position of these mines relative to the Dominion system of surveys and the north limit of the railway belt.

The return trip to Albert canyon was made in two days, when we moved to Bear Creek railway station, and went up the Beaver river trail to Grand Glacier, near the pass between Beaver and Duncan rivers. We ascended Grand Glacier and established station XXIV. on Grand mountain, lying between the two forks of the glacier (elevation 10,000 feet). This station takes the place of the one placed on Sugarloaf mountain in 1907, which was unsuitable for a station on account of the great depth of snow. The ascent of Grand mountain (August 7) was very disagreeable, especially crossing the enormous crevasses of the upper glacier, it being necessary in some cases to descend a couple of hundred feet into ice tunnels and caves to attain the higher reaches of the glacier.

From our camp at Grand Glacier we retraced our steps down the Beaver river trail for seven miles to a point opposite Bald mountain. Here we took horses up the steep face of Bald mountain, reaching the prairie-like summit in four hours, ascending over 3,000 feet at a fifty per cent slope. We nooned on the top of Bald mountain, and in the afternoon descended the easterly slope to the valley of the north fork of Spillimacheen river. By making this forced march over Bald mountain I was saved the hard trip up Grizzly creek, or the long journey *via* Carbonate Landing and the north fork trail.

We ascended to station XXII. and read angles there on two successive days, August 12 and 13. Forest fires by this time were raging in the mountainous district, and the smoke therefrom was very dense, especially in the direction of Duncan river and the Arrow lakes.

I also established a station, No. XXII. A, in the valley of the north fork of Spillimacheen river, and marked the point with a wooden post and stone mound. This reference station should prove useful for commencing new surveys in this valley, there being no posts of the Dominion lands survey system in the vicinity. I also occupied and established the position of three of Mr. A. O. Wheeler's stations, viz.: XXII. B (Wheeler's Bald mountain cairn), XXII. C (Wheeler's Spillimacheen cairn), and XXII. D (Wheeler's Grand glacier station).

The return journey was made down Bald mountain to the Beaver valley and thence back to Bear creek railway station, when a move was made to Flat Creek siding.

We ascended the trail up Flat creek some seven miles to the pass between that stream and Slick creek. Here we were laid up for several days with heavy rains, and when the weather cleared we took packs on our shoulders, went over Mt. Oliver, on the east side of the pass, and camped near the southerly base of Mt. Bonney. We then ascended to station XXV. (Mt. Bonney, elevation 10,200 feet) by the same route as in 1906. During the occupation of this station very cold winds prevailed, and the work was also retarded by smoke.

On moving to Six-mile Creek siding we ascended to timber line on the Esplanade range, as in 1908, and camped at Sunbeam lake, at the head of Spinster creek. From this camp I occupied station XXX. (Cherub Mt.), station XXX. A (Cupola Mt.), Station XXX. B (Sentry Mt.), and station XXX. E.

We then returned to Six-mile Creek siding and moved to Beavermouth to visit station XXIII. Here we were delayed several days by bad weather. I connected station XXIII. with the Dominion system of surveys, by tying this station to the iron post marking the northeast corner of section 34, township 29, range 25, west of the fifth meridian.

At Beavermouth Mr. de la Condamine, who was assistant to Mr. T. H. Plunkett, D.L.S., this season, was transferred to my party to assist in the measuring of the Kootenay base with the invar apparatus. On completing the occupation of station XXIII., we moved to Golden on October 3, and there examined the base line apparatus. We then moved up the Columbia valley to the base to proceed with its measurement. This work occupied us from October 21 to November 8, a detailed account of the measurement and the use of the invar apparatus being given hereinafter. On account of only twenty-four metre wires being available for measuring purposes it was necessary to alter the position of one end of the base in order to make the line an integral number of twenty-four metre stretches. This alteration necessitated the reoccupation of stations A, C and D.

The mountain survey season of 1909 was moderately dry on the whole and the triangulation work was not retarded any more than usual by continuous rains. In the month of August, however, considerable delay was experienced from smoke. High winds prevailed during the entire season, which also interfered with the work and as well caused us great physical discomfort on the peaks.

During the latter half of June, in the vicinity of Columbia river, north of Revelstoke, we had rainy weather on eight days. In the month of July, in the Illecillewaet valleys, there were fifteen rainy days, fourteen fine and two cloudy. In August in the valleys of the Beaver and Incomappleux rivers there were nineteen fine days, ten rainy, and two cloudy, with dense smoke during the greater portion of the month. During September, in the vicinity of Beavermouth and Gold creeks, rain fell on eleven days, nine were fine and two cloudy. In the upper Columbia valley the month of October was rather peculiar, nearly the entire month being cloudy in the day time, with rain at night. On the few fine days a dense fog filled the valley most of the day. On November 5 permanent snow fell in the Columbia valley.

THE MEASUREMENT OF KOOTENAY BASE WITH INVAR WIRES.

Kootenay base controls the complete network of the triangulation survey in the railway belt, British Columbia, from the summit of the main range of the Rocky mountains westward to the Cascade range. This base was laid out and its terminal points established in 1907, but no precise base measuring apparatus was available for its determination until 1909, when three twenty-four metre wires and the necessary auxiliary apparatus was finally received from the International Bureau of Weights and Measures.

M. P. Bridgland, D.L.S., 1910.—Nose Hill, Brushy Ridge, Spy Hill, Sarcee Butte, Chiniki, Granite Mt., Fly Hill, Mt. Mackenzie, Mt. Bonney, Albert, Mt. Griffin, Burniere Mt., Copeland Mt., Begbie Mt., Mt. Mara, Mabel Mt., Queest Mt., etc.

I left Calgary on May 31 for Golden, and after a few days arranging for my party and outfit we proceeded to Revelstoke, and began field operations on June 8.

The first mountain to be ascended was mount Mackenzie, near Revelstoke. A camp was placed at the base of the mountain where the Canadian Pacific railway crosses Illecillewaet river, about 2 miles east of the town. The slopes here are very steep, but as the timber has been burned off and there is not much undergrowth, they offer an easy means of ascent. Much snow was encountered on the upper slopes. On reaching the summit it was too hazy to obtain any satisfactory view, but a cairn was erected in the position of the station occupied by Mr. A. O. Wheeler in his photographic survey of the Selkirk range, 1901-02. No permanent marks were made.

On our return to camp, one day was lost owing to wet weather, and then the party started for Carnes creek at the north limit of the Railway Belt. Mr. Carson's secondary cairns erected the previous year on Roseberry mountain and Carnes mountain were located, and a high peak to the northeast of them was climbed and selected for a station. Unfortunately, owing to the depth of snow on the summit, it was found impossible to erect a suitable cairn. This was done later during a prolonged spell of smoky weather. This mountain is about 9,800 feet above sea-level and lies to the east of the north fork of Carnes creek.

It is rather difficult to reach, but is the only peak in the vicinity suitable for a station. The view from here is magnificent, and typical of the Selkirk range, consisting of deep, narrow valleys, heavily timbered, and glacier-crowned peaks rising proudly from the dark green slopes below. Snow fields and glaciers are visible in every direction, and to the northeast that unclimbed monarch of the Selkirks, mount Sir Sandford, rises high above all others. This station was called signal xxxv.

Our next trip was to establish a signal on mount Copeland, a prominent peak up Jordan river and about 15 miles northwest of Revelstoke. There is an old trail leading up this stream, but it had not been used for years and was in very bad condition, necessitating much cutting. The valley is from a quarter to half a mile in width, with very steep, rocky slopes on both sides. There is much excellent cedar and hemlock in the valley and on some of the lower slopes, and also a most luxuriant growth of fern and devil's club. We succeeded in getting horses about 9 miles up the stream and were then compelled to send them back and proceed on foot, owing to the lack of pasture and the poor condition of the trails. From here we followed the Jordan, which turns north at this point, for about 4 miles. Here the old trail turns west up a narrow valley leading to some old mining claims. This trail we followed for about 3 miles through dense alder slides, and finally pitched camp about 500 feet above the valley on the north slopes of mount Copeland (9,700 feet), which we climbed the day following. A hole was drilled in the rock at the centre of the base of the cairn to receive the brass bolt usually used for marking stations, and a

hole drilled for a reference bolt 7 feet south. The cairn is 5 feet 7 inches in diameter at the base and 7 feet high, and was called signal xxxvii. This trip occupied in all nine days.

On returning to Revelstoke, angles were read at the northeast corner of section 33, township 23, range 2, west of the 6th meridian, to connect the corner with mounts Mackenzie, Cartier, Begbie and Copeland. A trip was then made to the long tangent on the Arrowhead branch of the Canadian Pacific railway to find a suitable base for connecting mounts Mackenzie, Cartier and Begbie with the Dominion Lands surveys.

On July 3, a start was made for mount Begbie to the west of Revelstoke. Crossing Columbia river by the bridge at this point, we travelled south about 4 miles by means of a settler's trail. From here the horses were sent back and we proceeded on foot about 3 miles farther south to the base of mount Begbie. Camp was pitched at night on the side of the mountain about 2,000 feet above the Columbia valley. Much to our delight, the following day was fine and beautifully clear. The mountain offered no difficulty and we were on the summit by nine o'clock. A cairn was erected, 5 feet in diameter at the base and 8 feet 7 inches high. In the rock at the centre of the cairn a hole was drilled to receive the brass bolt and four holes, each distant 6 feet from the central hole and bearing north, east, south and west respectively, were drilled for reference bolts. This cairn was designated as signal xxxviii. The trip to this mountain and return occupied only three days.

On returning from mount Begbie, preparations were at once made to visit the Incomappleux valley. Horses and outfit were shipped by train to Arrowhead and thence by boat to Beaton, a small village at the head of the Arrow lakes. From here an excellent wagon road leads up the river to the almost deserted village of Camborne, about 6 miles distant. On the way the road passes through a fine canyon about a mile in length.

Ten years ago Camborne was one of the busiest mining camps in British Columbia, but now there are only three or four families remaining. Four mills have been built, but they are all lying idle, and one, at least, is in ruins. The country is all divided into claims, but no work, other than assessment work, is being done. The ore is chiefly quartz bearing free gold, and some very rich samples were shown to us by people living there.

The valley above Camborne consists of a low flat about half a mile wide with steep mountain slopes on both sides.

The bottom land appears very fertile and would yield good crops if cultivated. There is much excellent cedar and hemlock in the bottom of the valley and on the lower slopes.

On leaving Beaton, camp was taken to the mouth of Menhinnic creek, about 1 mile above Camborne. At this point there is a bridge across Incomappleux river, making it a very convenient base of operations for work on either side. On the west side of the river, a trail starts up Menhinnic creek and then turns across the mountain, leading to several claims high up on the slopes, the highest being the "Burnière" near the edge of timber-line. This trail had been recently repaired and was in good condition. A good wagon road also leads up the west side of the river for several miles. About 4 miles above camp another trail leads up Sable creek to the Trilby basin. This is also a mining trail, but has not been used for some years and is in very bad condition. On the east side of the river there is a good trail for about 12 miles. There are also several branch trails, one at Camborne leads up Poole creek to "The Silver Dollar" and other properties, about 5 miles farther up another trail leads up Lexington creek and a little farther on still another leads up the face of the mountain to a claim known as "The Mammoth." The main trail turns up Boyd creek, about 12 miles above Camborne.

Some difficulty was experienced in finding a suitable station in this locality as signal xxvii, which it was necessary to see from this point, was placed on a shoulder of North Albert peak. Eventually a peak about 8,000 feet above sea-level, a little to the northwest of Camborne, was selected. A cairn 5 feet in diameter at the

base and 8 feet 7 inches high was erected. This was designated as signal xxxii. Two secondary cairns were also erected, one at the head of Trilby basin and another on Kelly peak, a high peak on the east side of Incomappleux river and a short distance above Kelly creek.

This trip occupied in all sixteen days. The weather was very warm and smoky, but it was singularly fortunate that the smoke cleared off every day we climbed.

Leaving Camborne, we next moved to Comaplix on the north shore of Arrow lake. This is a busy little lumbering town, the headquarters of one of the mills of the Bowman Lumber Company. The smoke from a large fire across the lake was so dense that it was impossible to see any distance. Fortunately some heavy rains settled the smoke and we started for mount Sproat. Camp was taken by boat to a point about 3 miles west of Comaplix and thence up an old trail to a point about 2,000 feet above the lake. Next day the summit was reached after a long and tedious climb. Owing to storms while on top it was impossible to do anything except build a cairn. This cairn was 5 feet 6 inches in diameter at the base, 8 feet 6 inches high and was numbered signal xxxiii. During the ascent of this mountain we encountered on the upper slopes an old grizzly and two cubs. Next morning we returned to Comaplix, took the boat to Arrowhead and went by train to Revelstoke, reaching there on the evening of July 26.

On July 28, as it was very smoky with no indication of rain, we decided to revisit signal xxxv and erect the signal we were unable to build before. The signal was 5 feet in diameter at the base and 8 feet 2 inches high. This trip occupied six days, during all of which time it was too smoky or cloudy to make any observations.

On our return to Revelstoke, we were again delayed some days by unfavourable weather. We then set out to place a signal on mount Cartier to take the place of the one formerly erected on mount Mackenzie, which had proved to be unsatisfactory. Horses were taken to the end of the road about 5 miles south of Revelstoke, and then the party proceeded on foot. The brush proved very bad and the distance greater than we had expected, so it was not until the afternoon of the following day that we reached timber-line below the peak. On the third day mount Cartier was ascended and angles read where possible. Owing to smoke and local thunder-storms no satisfactory results were obtained.

This station was called signal xxxiv. It was marked by a brass bolt cemented in a hole drilled in the solid rock. The bolt was stamped with the number of the triangulation station, followed by a triangle having its apex at the centre of the head of the bolt. For reference points two iron bolts were cemented in holes drilled in the rock 6 feet north and south respectively of the geodetic point. Surrounding the permanent mark, a conical stone cairn was built, 5 feet in diameter at the base, 1 foot 6 inches in diameter at the top, and 8 feet high. The cairn was placed in the position of the photographic station occupied by Mr. A. O. Wheeler in his topographical survey of the Selkirk range, 1901-2.

The return trip was made on the fourth day by way of what is known as "the green slide." This is a long open slope swept clear by frequent avalanches, and proved a very easy means of descent to the railway. From there we walked back to Revelstoke, a distance of about 9 miles.

We next moved to Three Valley, a small lumbering town 14 miles west of Revelstoke, to establish a station on Griffin mountain, leaving the pack-train at Revelstoke in charge of one of the men. Three days were lost through smoke and wet weather. On August 16 we started for the peak, commencing the ascent at a point on the railroad about a mile and a half west of Three Valley. Our path led up steep slopes which had been burned over many years ago and were nearly free from underbrush. Blueberries were found in great abundance. On reaching the summit of the ridge, we turned westward along the ridge until the highest point was reached. Here a disappointment awaited us, for we found that a slightly higher peak, some distance south and on the same ridge, cut out everything in that direction. Accordingly we

turned back and followed the ridge to the other peak, which we reached about one o'clock, after a climb of nine hours. Further delay followed on account of clouds, and it was nearly six o'clock before we started for camp. Fortunately it was a fine moonlight night and we reached camp safely about half past nine.

This mountain (signal xxxix) although low, is excellently situated for a station. It was marked by a hole drilled in the solid rock. Over this hole a cairn was erected 5 feet in diameter at the base, 2 feet in diameter at the top, and 9 feet 2 inches high.

Craigellachie was then visited to ascertain the truth of certain rumours regarding a trail up the north fork of Eagle river, and also of one up Queest mountain. We found that there was an old trail for about 20 miles up the north fork of the Eagle, but we could not find any up Queest mountain. The trail up Eagle river is rough and will require considerable chopping, but it will be very useful in establishing a station near the north limit of the Railway Belt north of that point. It was originally built by lumber companies in order to get some of their limits surveyed. As the weather was still unfavourable, and feed scarce, it was decided not to bring the horses, but to move to Salmon Arm and make use of the bad weather to locate a base line.

On August 20 I went to Revelstoke and made arrangements for shipping horses and outfit to Salmon Arm. In the evening I returned to Craigellachie, and the following day moved to Salmon Arm. The remainder of the outfit did not arrive until August 23.

On the 24th a start was made for the Hunters range on the east side of Mara lake. Throughout this district good wagon roads have been built in all the principal valleys. We followed the Enderby road for about 9 miles and then turned north to Mara. Crossing Shuswap river by means of the bridge at this point, we camped at Mr. Blurton's, near whose place an old Indian trail ascends to the summit of the range. As this trail was very nearly obliterated, I decided to get Mr. Blurton to accompany me for a few days.

The following morning we started for the summit of the range. Until an elevation of 4,500 feet was reached the trail led through green timber, chiefly small fir, poplar and willow. It then entered a tract of old *brulé* where it was almost impossible to follow it, as it wound in and out among burned logs and fallen trees. After travelling through this for about three hours we reached the summit of the ridge. This summit consists of rolling benches with large open meadows and clumps of scattered spruce and balsam. Country of a similar nature extends from here to Griffin mountain above Three Valley, a distance of about 25 miles. Camp was pitched that night in a beautiful open meadow about 3 miles from the point where we first reached the ridge. Next day we travelled about 10 miles farther north to the base of the highest peak on the range, about 7,300 feet above sea-level.

In the meantime the smoke had become so dense that it was impossible to see anything half a mile away. The peak was ascended and a cairn erected, but we were unable to decide whether or not it was suitable for a station. When the weather cleared some days later it was found necessary to place the cairn on a ridge about 1 mile south and about 100 feet lower.

The station was marked by a hole drilled in the solid rock to receive the permanent brass bolt. With this hole as a centre the cairn was built, having a diameter of 5 feet 6 inches at the base and a height of 9 feet 6 inches. The cairn is situated on the solid rock ridge affording an excellent location for permanent marks. This station was designated as signal xlii.

On September 3 we left Mara and moved down to Enderby, where we remained over Sunday. On Monday we started for Mabel lake, following a good wagon road which leads up the Shuswap valley to the lake, a distance of about 24 miles. There is considerable good land in the valley, but much of it is held in timber limits, which are not likely to be thrown open for settlement until the timber is taken off.

In order to reach mount Mabel we borrowed a boat from the A. R. Rogers Lumber Company, and took a light camp to the mouth of Cottonwood creek. Here we

found an old Indian trail leading to timber-line, and by means of this trail the ascent was made. There is some good cedar, hemlock and fir on the mountainside, but the slopes are so steep that it would be very difficulty to get it out.

As time was short and loose rock was very scarce, a cairn was not erected. A hole was drilled in the solid rock to receive a permanent bolt and the butt of a tree 18 inches in diameter and 9 feet high was carefully centred and plumbed over the hole. This was securely braced and a piece of white cotton tacked around the upper end. This was designated as signal xli.

Two days were spent looking up the position of some of the Dominion Lands Survey posts in the vicinity and a secondary signal was also erected on Trinity hills, about half-way between Mabel lake and Enderby, on the south side of the valley. This trip occupied eight days, during all of which time the weather was cloudy and showery.

On returning to Enderby, a secondary station was placed on a low rocky hill near the northeast corner of section 22, township 19, range 9, west of the 6th meridian. The party then moved to Salmon Arm, where much of the remaining time was devoted to work on the base line.

During a few days of fine weather, a trip was made to mount Ida. Considerable difficulty was experienced in finding a suitable station as the top of the mountain consisted of a rolling flat, heavily timbered. This made it necessary to visit practically every ridge on the summit. A sharp knob on the eastern side of the mountain was finally selected as a suitable point. This is not the highest part of the mountain, but it offers a good view in most directions and is the most favourable point for connecting with the ends of the proposed base in the valley.

Advantage was also taken of two or three fine days to visit Granite mountain and see if it would be possible to obtain a station thereon, from which the ends of the proposed base could be seen and also the peaks necessary for further expansion. It was found that the summit of this mountain consisted of a rounded rocky ridge heavily timbered with second-growth jack pine. A suitable point was selected on a shoulder about 20 feet below the summit and a temporary signal erected. Lines of sight were also cleared to existing signals and to some of the other peaks likely to be useful for stations.

During the last month of the season, much of the weather was too cloudy or smoky for work on the summits, and much of the time was spent trying to secure a suitable location for a base line. For this purpose a line a little over 5 miles in length was located, commencing on the east side of Salmon arm of Shuswap lake, about 1 mile northeast of the town. From here it runs in a southwesterly direction, passing along the shore of the lake and through the Salmon Arm Indian reserve. This line was cleared out so that the ends were intervisible, but no attempt was made to prepare it for actual measurement.

On September 21, instructions were received to close work in the mountains as soon as possible, in order to attend to some miscellaneous surveys in Alberta and Saskatchewan. Accordingly on October 11 arrangements were made for shipping the horses and outfit back to Golden. Here the outfit was stored and the horses sent out to Mr. McKeeman's ranch, about 30 miles south of Golden for the winter.

During the season the work was greatly retarded by rain and smoke. During the interval from June 1 till October 10 it had rained on thirty-nine days and was very smoky and hazy on twenty-nine other days, a total of sixty-eight days out of one hundred and thirty-two. This does not include days on which the clouds were hanging low on the peaks, a condition almost equally unfavourable for work.

The district around Salmon Arm and the Shuswap valley is in a very prosperous condition. Long ago, all the available land in the valleys was taken up for farming. Recently much attention has been given to fruit growing, and this has resulted in much land on the mountain slopes, formerly considered worthless, being taken up by settlers. The limits of the useful land are still being extended and it is impossible to say where cultivation will eventually cease. During the season of 1910, there was a very heavy crop of apples, pears, plums and small fruits, and nearly all the settlers engaged in fruit growing were enthusiastic about their success.

M. P. Bridgland, D.L.S., 1911.—Rosebery Mt., Carnes Mt., Mt. Copeland, Mt. Begbie, North Mt. Albert Peak, Comaplix, Mt. Cartier, Griffin Mt., Hunters Range, Mt. Mabel, Mt. Ida, Granite Mt., etc.

SIR,—I have the honour to submit the following report of my field operations on the triangulation in British Columbia, in connection with the trigonometrical section of the Topographical Survey of Canada, for the season of 1911.

The work was commenced May 8, and in accordance with your instructions dated April 24, 1911, directing that the eastern part of the triangulation be retraced, an attempt was made to find station i, on the fifth meridian, and station ii, on Nose hill.

At the latter station the old wooden hub was found. Station i was re-established as nearly as possible in its original position on the 5th meridian, 17.25 chains south of the northeast corner of section 13, township 24, range 1. Of the next four stations established by Mr. Drewry in 1890, old hubs were found at station v (Sarcee Butte), and station vi (Cochrane). At stations iii and iv (Brushy ridge and Spy hill) no trace remained of the original stations, and these were accordingly re-established on the highest points of the ridges. Angles were read at all these points, giving a new set of angles for four triangles at the eastern extremity of the system. Also stations iii, iv and vi were connected with the nearest monuments of the Dominion Lands system. Each of the above stations was marked by a brass bolt embedded in cement, the top of the bolt being about two feet below the surface of the ground, and flush with the surface of the cement. The bolt in each case was stamped with a triangle and with the number of the station in Roman numerals. The apex of the triangle faces north, is at the centre of the head of the bolt, and is the geodetic point. For reference points three-foot iron posts were used and at least one placed at every station except station v. These posts were driven down to within about five inches of the top and were stamped with "T.S." and the number of the station on one side, and "W.P." followed by the distance in feet and the bearing to the station on the opposite side. At station v (Sarcee Butte), which was on a rocky ridge, two iron reference bolts were cemented into solid rock and their bearings and distances from the station measured.

An effort was also made to locate Mr. Drewry's base near Cochrane, which he had established in 1890 and marked by iron bars. The post at the east end was found, but the post at the west end had evidently been removed.

As is usually the case in this class of work, considerable time was lost through unfavourable weather. Also much delay was caused by excessive refraction. It was found impossible to sight on signals with any certainty between 8 a.m. and 5 p.m., except on cloudy days.

On June 5, a start was made for Revelstoke, two of the party having been sent ahead to get the horses and outfit stored at Golden. A stop of one day was made at Morley to locate station vii (Chiniki) and connect it with the Dominion Lands system. The station was found and tied in to the post at the intersection of the north boundary of township 24, range 7, west of the 5 meridian, and the south boundary of the Stony Indian reserve. This station was not permanently marked.

By June 8 the party was camped at Revelstoke and ready to commence work on the western part of the triangulation. Owing to a very heavy snowfall and a later spring, work on the higher peaks was found to be impossible, and a short exploratory trip was made to Salmon Arm to select points to help in the expansion of the base. The western part of Bastion mountain was visited but was found unsuitable. Permanent signals were erected on Granite mountain and on Fly hill, about 5 miles southwest.

In the meantime two of the party had twice attempted to erect a signal on Queest mountain above Shuswap lake, but owing to the great depth of snow they were unable to do so. Later on, about June 28, this was done. The ascent was made from Craigellachie, crossing George creek some distance north of the railroad. There is

much fine timber in this district. The ascent by this route, and also the descent, was found to be very tiresome and tedious. Later on the mountain was ascended from Malakawa, the ascent being made easily in about six hours.

An attempt was made to locate the sixth meridian, a short distance east of Revelstoke. Owing to fire and lumbering operations the monuments here have been destroyed and the nearest existing post is the northeast corner of section 34, township 23, 2 miles farther west. Owing to the canyon-like nature of the Illecillewaet valley it was found impossible to make a direct tie to mount Albert, and later on a secondary station was established on mount Mackenzie. This station served to connect mount Albert with the above-mentioned section corner, and also helped to connect mount Begbie and mount Copeland with the northeast corner of section 33, township 23, range 2, west of the 6 meridian.

Throughout all of June and the early part of July it was cloudy most of the time and considerable rain fell, so that it was very difficult to get any work done. Accordingly, having instructions to make connections between Cascade mountain (station xii) and Storm mountain (station xiv), mount Bonney (station xxv) and the posts of the Dominion Lands system, it was decided to move to Banff, and on June 11 camp was pitched near the town.

A suitable base was found which could be connected by a short traverse to the middle of the north boundary of section 1, township 26, range 12, west of the 5th meridian. The ascent of Cascade mountain from the west side offers no difficulty. An old wagon road leads up Fortymile creek to the waterworks dam. From there the route leads northerly along the side of the mountain, gradually ascending until a deep canyon is reached, whence a steep slope leads directly to the ridge from which the main peak is easily accessible. The slopes throughout are easy, there being no standing timber and very little windfall. The station lies on the highest southerly point of the mountain. The old cairn had fallen over, but the base was still intact. It was rebuilt to a height of 6.7 feet.

On July 17, the party moved to Castle mountain. A good base about 143 chains long was obtained about 2 miles west of the station, and by means of this Storm mountain was connected with the survey posts in the valley. An azimuth observation was taken at the west end of the base. The route followed from the railroad to Storm mountain was practically the same as that described by Mr. Carson in his report of 1906, contained in the annual report of the Topographical Surveys Branch for the year 1906-7.

Our next move was to Glacier, where a base 60 chains in length was selected just east of the Ross Peak water-tank. By means of two secondary stations, one on the side of mount Cheops and the other on mount Abbott, this base was connected to mount Bonney.

The ascent of mount Bonney was made by what seems to be a new and very much easier route than those previously followed. A light camp was taken to the head of a small valley which joins Illecillewaet river about a mile west of Ross Peak station. From there a steep but easy climb leads to the snowfield at the back of mount Bonney. Crossing this snowfield, the ridge above the basin of Loop creek was reached and from there the arête runs directly to the summit. Under favourable circumstances it should not be a difficult matter to make the ascent from Glacier in a day and a half, if the first afternoon were devoted to taking camp to the head of the valley, and the day following to the ascent of the mountain and the return trip.

On the evening of August 4, we returned to Revelstoke. At first the smoke was very dense owing to forest fires close by, but heavy rains soon remedied this. As soon as the weather permitted, camp was taken part way up mount Mackenzie, and on August 9, the peak was ascended and the return trip made to the railroad the same day. The route followed was the same as that taken in 1910. The station was marked by the usual brass bolt stamped with a triangle and the number of the station xxxivA. The apex of the triangle faces north and is at the centre of the head of the

bolt. Two iron reference bolts were also placed, one 6 feet south and the other 6 feet north from the station. A cairn 5 feet in diameter at the base and 7 feet high was built above the station.

The next station visited was Albert (xxvii) following the route described by Mr. Carson in his report for the season of 1909, contained in the annual report of the Topographical Surveys Branch for the year 1909-10. Owing to difficulties connected with the location of station xxxii near Camborne, we could not complete the work at this point, and had to return again later in the season.

On returning to Revelstoke it was decided to visit mount Griffin (xxxix) leaving two of the party to ship the horses and outfit to Camborne, thus saving all the time usually lost in shipping and moving camp. Accordingly a light camp was taken to timber-line on mount Griffin just below the signal, following the same route as in 1910. Two days were spent there reading angles and taking azimuth observations. The station is marked by a brass bolt stamped with a triangle and the number of the station xxxix. Two iron reference bolts were also placed, one 13.5 feet south and the other 18 feet north of the station. All bolts were cemented in solid rock. Above the station a cairn 5 feet in diameter at the base and 9.3 feet high was built.

On August 10, main camp was reached above Camborne. As soon as possible, camp was taken to timber-line below mount Burnière, following the trail to the Burnière mine. This trail had been recently cleared out and was in much better condition than in the previous year. On ascending mount Burnière, the following day it was found necessary to establish a station on a peak about 500 feet higher and about 2 miles farther west. This peak proved to be very suitable for a station, and angles were read and an azimuth observation taken. This station was called Incomappleux.

The peak consists of a long narrow ridge with precipitous rock faces on the south side and glaciers on the north. The station is near the eastern end of the ridge, and is marked by a brass bolt stamped with a triangle and the number of the station, xxxii. Four reference bolts, marked, were placed as follows: The first 4 feet north, the second and third each distant 5 feet from the centre and bearing south 65° east and south 20° west respectively, and the fourth 4 feet distant and bearing south 55° west. All bolts were cemented in solid rock. Over the station a cairn 4 feet in diameter at the base and 6.5 feet high was built.

At mount Burnière, a secondary station was established. This station overlooks the Incomappleux valley and should be very useful for making any necessary connection with the monuments of the Dominion Lands system in the valley. The station was marked by the usual brass bolt stamped with a triangle and the number of the station xxxiiA. Four reference bolts were placed as follows: One north 5.5 feet, the second north 84° east and 6.3 feet distant, the third bearing south $34^{\circ} 30'$ east and distant 7.9 feet, and the fourth bearing north 82° west and 12.6 feet distant from the centre. A cairn 5 feet in diameter at the base and 8.4 feet high was built.

On August 29, we returned to Revelstoke, but were again delayed by rain. As soon as the weather permitted, we again ascended mount Albert and completed the work there. An azimuth observation was also taken at this point.

On September 5, a start was made for mount Copeland, near the head of Jordan river. The Jordan trail had been partially repaired during the summer, but it was still in poor condition. On the first day camp was taken as far as possible by horses, and on the second a light camp was taken to an amphitheatre below the peak. Two days were lost through bad weather, but the third day was beautifully clear. The station is marked by a brass bolt stamped with a triangle and the number of the station xxxvii. Three reference bolts were placed as follows: One bearing south 82° east and distant 4.7 feet, the second bearing south 5° west and distant 7.1 feet, and the third bearing north $36^{\circ} 30'$ west and distant 7.0 feet from the station. A cairn 5 feet in diameter at the base and 7 feet high was built.

On September 10, we again reached Revelstoke, and next day started for mount Begbie, hoping that we might have a few days of continuous fine weather. This hope

was vain. We camped at an elevation of about 6,500 feet on the side of mount Begbie the second day. The weather had been fine, but about four o'clock heavy black clouds rolled over the summit, and it was not until September 25, that we were able to make the ascent. Then the mountain was covered with about 18 inches of fresh snow and the weather was cold, making instrument work on top very difficult and disagreeable. This station is on the highest eastern point of the mountain. It is marked by a brass bolt stamped with a triangle and xxxviii. Three reference iron bolts were placed, each 6 feet from the station and bearing east, south and west, respectively, from it.

The party next moved to Enderby and camped on Shuswap river, a short distance below the village. While preparations were being made to visit mount Mara and Mabel mountain, a station was established on a low bare knoll near the northeast corner of section 22, township 19, range 9, west of the 6th meridian. The station is marked by a brass bolt stamped with a triangle and the letter "E." Three iron reference bolts were placed, one bearing south $42^{\circ} 25'$ east and distant 12.3 feet, the second bearing south 53° west and distant 12.2 feet, and the third bearing north $56^{\circ} 20'$ west and distant 4.7 feet from the centre. All bolts are cemented in solid rock.

On October 2, we started for mount Mara near the summit of the Hunters range. The route followed was exactly the same as that taken the previous year. The signal was marked by a brass bolt stamped with a triangle and the number of the station, xlii. Four iron reference bolts were placed bearing north, east, south and west from the signal, the first three being 6 feet and the fourth 9 feet distant from it. All bolts were cemented in solid rock.

The next trip was to Mabel mountain. This was reached by crossing Mabel lake and following the Indian trail up the mountain. The trail has not been used recently and is fast becoming obliterated. The station itself lies in the western part of the summit, overlooking Mabel lake. It is marked by the usual brass bolt stamped with a triangle and the number of the station, xli. Four iron reference bolts were placed as follows: The first north $4^{\circ} 30'$ east and distant 4.4 feet, the second north $71^{\circ} 00'$ east and distant 11.3 feet, the third south $32^{\circ} 30'$ west and distant 11.2 feet, and the fourth north $66^{\circ} 40'$ west and distant 10.5 feet from the signal. All bolts were cemented in solid rock. On the west bank of Kingfisher creek, starting at the northeast corner of section 15, township 19, range 6, a line about 120 chains long was run in a north-westerly direction. This line was carefully measured and affords a direct tie to the iron post at the above section corner.

Our next move was to Salmon Arm. From here a light camp was taken up to Malakawa in order to ascend Queest mountain. On October 20, we started and reached the summit about two o'clock. Owing to clouds and slight snow flurries, we could do nothing that evening and spent the night shivering around a camp-fire. Fortunately the next morning was clear and we completed our work and returned to Malakawa in time to catch the evening train to Salmon Arm. At Queest mountain (station xliii) no permanent marks were left. The station is on the southwest point of the mountain and is marked by a cairn 4 feet in diameter at the base and 6.5 feet high.

On returning to Salmon Arm a few days were spent ranging out the base and taking magnetic observations where possible. The horses were sent down to Vernon, arrangements having been made to winter them there, and on October 28, the outfit was shipped to Calgary.

On November 1, finding it possible to do so, I took an azimuth observation at station i, on the 5th meridian, using as a reference object a signal at station ii, on Nose hill.

From October 3 to 23, I was engaged in making a survey of some villa lots at Banff, and a correction survey near Airdrie, in township 27, range 1, west of the 5th meridian. Owing to snow and intensely cold weather it was found impossible to

make satisfactory progress and consequently when the latter survey was completed, I closed work for the season.

M. P. Bridgland, D.L.S., 1912.—Bastion, Armstrong, Griffin, etc.

Preparations for the season's survey were begun on May 3, 1912, and after making a survey of some villa lots at Banff, we left Calgary on May 9, reaching Salmon Arm in the railway belt on the 13th.

The time from May 14 till June 10 was spent on work around Salmon Arm. Two new stations were established, "Bastion" on a shoulder of the Bastion mountains five miles west of Sicamous, at an elevation of about 4,200 feet, and "Armstrong" on a burnt ridge about six miles east of Armstrong railway station, at an elevation of 5,300 feet. The latter station lies nearly a mile south of the southern limit of the railway belt at this point. In addition to the above, a third station was established on a high peak in township 18, range 13, west of the sixth meridian. Of these stations, Bastion is the only one permanently marked.

Angles were read at both ends of the Salmon Arm base and at Ida, Granite, Fly hill and Bastion. All of these stations are easily reached, and no description of the routes followed is necessary. In addition, some work was done on the Salmon Arm base. The main camp was situated near the centre of the base, and any time not otherwise utilized was spent clearing the line.

On June 11 the party moved from Salmon Arm to Malakwa, at the base of Queest mountain. A light camp was taken to timber line just below the summit, though, owing to the large quantities of snow still remaining, considerable difficulty was experienced in finding a suitable camp ground. Then the weather changed, and for some days nothing was visible but snow, rain or fog.

On the 16th and 17th the weather cleared, the work was completed, and camp moved down to the valley. The temperature on the 17th was 103 degrees Fahrenheit in the shade, and although the descent was not difficult all members of the party were nearly exhausted on reaching the main camp.

On the 19th the main camp was moved to Revelstoke, and in the evening a light camp was brought back to Three Valley to climb Griffin mountain. In order to avoid excessive heat, the climb was started that evening, and a point about 800 feet above the valley was reached. During the night a very high wind blew down a large stub which fell about two feet away from the side of the tent. This, combined with an uncomfortable bed, helped us to get an early start the next morning. At noon camp was pitched a short distance below the summit, and in the afternoon a set of angles was read. The following day smoke was so dense that further work was impossible, consequently the signal was re-erected, and the party returned to Revelstoke.

At Revelstoke Mr. McDiarmid's longitude station was located, and the angle at that point between Mount Mackenzie and Mount Begbie was read.

It was then decided to establish a station near the south limit of the railway belt, west of Columbia river. The party crossed the river at Wigwam, and then crossed a low divide between there and the bend of Cranberry creek. The left bank of the stream was followed till the first large stream entering from the west was reached. Camp was pitched about four miles up this stream, and the station was established on a peak about 9,000 feet above sea-level, and lying almost directly south. Angles were read, the station permanently marked and a cairn erected, although some severe thunderstorms caused a hasty retreat from the summit on more than one occasion. There is much large timber through this section, chiefly cedar and hemlock, but much of the country is so rough that it would be a very difficult matter to get it out.

Up to this time, plans formed during the early part of the season had been fairly well carried out, but here all work was disarranged, and remained so for the rest of the season. From June 28 till July 15 all instrument work was impossible owing to rain

and clouds, and the only work done was to move camp from Revelstoke to Albert canyon, by the Canadian Pacific railway, and thence by pack train up the north fork of Illecillewaet river to 'the farm.' A light camp was pitched at timber-line below "Cornice," and on July 15 an attempt was made to read angles. Work in this valley was completed on July 18.

Mount Bonney was the next station on the list, but by the time Albert canyon was reached, smoke was so dense that work there was considered impossible. Consequently the party returned to Revelstoke and ascended Mount Mackenzie. The distances from there to the longitude station at Revelstoke and to Mount Begbie were short, but it was only with difficulty that the signals could be seen.

After the work was completed on Mount Mackenzie, the rain began again. Consequently the party started for Mount Carnes signal near the north limit of the railway belt. This is the same mountain that has been called Mount Serenity by Mr. Howard Palmer. The route taken was the same as that followed in 1910. Angles were read at the signal, the station permanently marked, and the cairn rebuilt. A set of photographs was taken at the signal and two secondary stations were occupied. The whole trip took eight days, only three of which were fine.

The remaining stations to be reached from Revelstoke were Mount Bonney, Mount Albert and Mount Begbie. These ascents were all made by the same routes as in 1911. In each case several days were lost through bad weather, and it required twenty-two days to make the three climbs.

The party then moved to Enderby and thence to Mount Mara signal in the Hunter range. Sixteen days were spent on this trip, twelve of which were stormy. Angles were read and an azimuth observation taken.

On September 11, the party started for Mabel mountain, following the same route as in the previous year. This trip was made in five days, during which a complete set of angles was read and an azimuth observation taken. During the other four days the party travelled fifty miles by pack-train, eight miles by boat, packed camp on their backs for twelve miles, and climbed 5,500 feet.

On September 17, word was received that Mr. C. de la Condamine was waiting at Salmon Arm to commence work on the base line, and the day following the party moved over to the Arm. Angles were re-read at the ends of the base and at Mount Ida and Granite Mountain. Several attempts were made to get an azimuth at the south end of the base but, owing to clouds and excessive refraction, no satisfactory results were obtained. All triangulation work was completed on September 30.

On September 19, two men were placed at Mr. de la Condamine's disposal to assist in preparing the line. These men remained with him except for two days while assisting on Granite mountain. The other members of the party worked on the base line while not otherwise employed. The actual measurement of the base line by the invar wire was commenced October 7, and completed November 4, during which time four measurements were made. In addition to this the base was connected with several Dominion Lands posts. A full report on the measurements of the base is being prepared by Mr. de la Condamine.

It had been intended in the early part of the season to make a rough photographic survey of the country lying between the north fork of Illecillewaet river and Columbia river, an exceptionally fine alpine country. Owing to bad weather, it was soon found that this would be impossible. However, photographs were taken whenever it was possible to do so without interfering with the triangulation work. Unfortunately these were nearly always taken in cloudy or smoky weather.

The season of 1912 was very unfavourable for any kind of topographical work. In addition to exceptionally wet and cloudy weather, smoke caused much trouble. Immediately after heavy rains, smoke or haze was sometimes so dense that it was almost impossible to see signals. From June 17 to 25, the weather was very hot, the temperature going as high as 103 degrees Fahrenheit in the shade at Revelstoke.

From June 26 to September 8, usually the most favourable season of the year, there was rain or low clouds fifty-four days, and heavy smoke seven days, a total of sixty-one days out of seventy-six, and of the remaining fifteen hardly one day was actually clear of clouds or smoke.

BLAEBERRY CREEK VALLEY.

Report by J. A. Kirk, D.L.S., dated March 14, 1907.

SIR,—I have the honour in accordance with my instructions, to submit the following report of my survey to establish the north boundary of the Railway Belt at Blaeberry creek in the province of British Columbia.

The survey consisted of two traverse lines run from the northeast corner of section 20, township 28, range 22, west of the 5th meridian up the valley of Blaeberry creek to the objective point, a distance approximately of 25 miles. My report may therefore be appropriately styled 'A report on that part of the valley of Blaeberry creek within the Railway Belt.'

Blaeberry creek rises in a large glacial area, crowning the divide of the Rocky mountains at about 117 degrees of west longitude. It flows southerly for about 12 miles and enters the Railway Belt at the north boundary of section 10, in township 31, range 20, west of the 5th meridian. It continues southerly and southwesterly through ranges 20, 21 and 22 to its confluence with Columbia river in section 30, township 28, range 22, a distance of between 26 and 27 miles.

The west side of the valley is paralleled by a range of mountains that rise in lofty and picturesque peaks, broken only by the narrow valley of a stream which rises in the glacial fields on the divide and flows southwesterly to its junction with Blaeberry creek at a point about three-quarters of a mile south of the boundary of the railway belt. As this stream materially increases the volume of the Blaeberry, it may appropriately be designated the "west fork."

On the east side a ridge runs parallel to Blaeberry creek from the north boundary of the Belt, southerly for about 6 miles. The flanks of three ridges bearing southeasterly constitute the east side of the valley between this point and the valley of the Columbia. The streams flowing through the three valleys thus formed comprise the tributaries of Blaeberry creek from the east. The middle one I have named the "east fork," as it is larger than the other two together, and contributes to the main stream nearly if not as much water as the "west fork." The discolouration of the water in the summer shows that the "east fork" and the stream to the south of it are fed by glaciers.

Several small streams rise on the faces of the mountains on either side of the valley and from springs along the bordering flats, and these in many cases disappear by sinking under the surface. The valley is naturally divided as to its physical features into three parts which, for convenience of reference, I have named the upper section or gravel flats, the central or rocky section, and the lower or bench land section. My description will begin with the central or rocky section.

CENTRAL OR ROCKY SECTION.

A series of ridges which cross the valley and unite the mountains on either side, extend southerly for about 5 miles from a point about a quarter of a mile above the mouth of the "east fork." Through these ridges, which consist of a species of soap stone soft enough to be scratched by a finger nail, the creek has cut a channel from 15 to 75 feet in width. In places the vertical walls of the canyon thus formed are over a hundred feet in height. Through this section the creek is a succession of rapids as the total fall is probably not less than 250 feet. Further reference to this section is made in the paragraph following the description of the upper section.

UPPER SECTION.

Proceeding up stream from the canyons, the bottom of the valley is a gravel flat, on which, speaking generally, there is a light covering of soil that increases in places to several feet in depth. It seems evident that the rock at the entrance to the canyons has not been cut out as low as the grade of the rock forming the true bottom of the valley above, and that the dam thus formed holds the gravel forming the flats as in a basin. The creek meanders with a swift but uniform current in a channel that is constantly shifting during times of high water. An expanse of gravel bars has thus been formed that is constantly increasing in width by the erosion of the banks.

The valley averages about half a mile in width. The mountains forming its bounds have the usual features of the Rocky mountains. The summits are destitute of vegetation, and often rise in sharp ridges and peaks of fantastic outline. The faces of the hills are frequently a succession of slides, while the slopes at their bases are composed of sharp-edged rocks that have fallen from higher levels. These slopes are usually covered with soil. The soil on the west side generally reaches higher levels and is of better quality and greater depth than on the east side.

The country is covered with a growth of spruce, cedar, fir, hemlock and pine, spruce predominating. On the lower levels of the mountains and on the flats along the shore of the creek, there are belts of timber that will run from 12 to 24 inches in diameter at the butt end. The cedar is usually hollow and not large enough to have sufficient sound wood to make it valuable. The other woods are generally of good quality, but as is common in this section of the country, the trees contain but a small percentage of high-grade or clear lumber. I estimate that there is between three and four square miles carrying from twenty-eight to thirty million feet log scale of merchantable timber in this section. In addition to the timber described, the country is covered with a smaller growth admirably adapted for pulp wood.

This section is remarkable for the absence of traces of forest fires. If my conclusions are correct, this is due to the following causes: During the summer months, while the country in the vicinity of Golden is parched for want of rain, storm clouds are often seen approaching from the west which turn to the left at mount Moberly and continue up the valley of Blaeberry creek. Along the upper reaches of the creek these clouds precipitate their moisture. This phenomenon probably prevails during the winter when the precipitation augments the glaciers in which the creek rises. The greater portion of the rain falling on the rocky surface of the summits unwatered by the Blaeberry, does not form into creeks, but descends rapidly to the débris at the base and percolates through the soil, thus keeping it constantly moist, while the flats bordering the creek, while not swampy, as a rule are full of springs from the same source. This feature is an important point in connection with the area I am now describing as it appears to thoroughly protect the forest from fire. It is true that burnt trees are to be seen high up on the mountain side that have grown on small ledges of rock, but this fact accentuates my point, as in such places the moisture rapidly drains off.

CENTRAL OR ROCKY SECTION—(*Continued*).

In the section cut by canyons the gravel flats are replaced by bench land through which ridges of rock protrude. The country has been overrun by fire and only isolated patches of a large forest remain. The precipitation decreases as the Columbia valley is approached, while the drainage from the mountains and local rainfall, sinks rapidly through the porous, sandy and gravelly soils of the bench lands, leaving the surface dry, and in a favourable condition for the spread of fire. Young forests of pine, spruce, etc., are covering the *brulé*.

The trees are small yet, but in time if protected they will have a commercial value. There remains near the southern part of this section about a third of a square mile

of fine spruce, balsam, etc., estimated to contain about five million feet, log scale. Along the banks of the east fork there is a fine body of spruce and balsam, but I had no opportunity to go through it.

From the foot of the canyons the stream flows in a channel from seventy-five to a hundred feet wide, for about a mile and a half. From this point to a small canyon near the railway it meanders through gravel bars similar to those described on the upper reaches of the creek. Emerging from the canyon, which is almost a quarter of a mile long, the creek crosses the flats of the Columbia and soon forms part of that river. In this section the valley widens. Bench lands that have been overrun by fire, and on which a new forest is appearing, are its principal features until it merges into the valley of the Columbia.

Respecting the valley of the Columbia, I would refer to my report on the survey of sections 1, 2 and 3 in township 28, range 22, west of the 5th meridian, particularly to the part reading as follows:—

I have been told that this land is part of a timber reserve, and therefore not open for settlement. There is no timber here, and apparently never will be, as the new growth is confined to willow and poplar. If it is supposed that by keeping the place in a natural state an efficient fire break is provided between the railway and the country to the north, I would point out that the dead timber now strewn over the ground is very inflammable and a source of danger, while a cultivated field cannot be surpassed for checking the spread of fire. I would therefore take the liberty of suggesting that if this land is in a timber reserve, that the reserve should be withdrawn from that part that may be called the valley of the Columbia.

A wagon road from the town of Golden runs northwesterly alongside of the Canadian Pacific railway through Moberly, a flag station, to Blaeberry creek. This road is kept in repair by the Provincial Government. From this point a good trail runs along the east side of the creek for about 18 miles. The gravel bars of the river afford good travelling for points farther north.

The soil throughout the valley is of a sandy and gravelly nature. The prevalence of summer frosts and late springs make its use, for general agricultural purposes, out of the question. Hay could doubtless be grown, but there are no wild hay lands. Feed for horses when travelling is not plentiful.

During the summer months the volume of water in Blaeberry creek is large. In the winter it is said to dwindle to insignificant proportions. The water during the time of high water is heavily charged with silt. The fall in the canyons is sufficient for the development of a large amount of power. The problem of bringing logs down the shifting channels that have been described seems difficult. My opinion is that a dam could be thrown across the creek at the entrance to the upper canyon, that would submerge the gravel bars and permit of the transportation of logs in safety. The extent of country that would be flooded and the damage that might be done would have to be considered when deciding on the height to which the water would be raised. A dam at the canyon near the railway would cover the bars on the lower reaches. As the banks are high in this section, it is probable that raising the level of the water would not affect the adjoining country. Wood is always available for fuel.

No indications of coal or lignite were seen. North of the east fork a mile or two, the mountains on the east side of the valley are strongly coloured with iron; with this exception no indications of minerals were seen.

Bears and goats are plentiful. This valley is of no apparent value except for its timber and pulpwood resources. The upper reaches are the most valuable in this respect. The poor and shallow soil is not conducive to timber of large size. The ground seems unable to provide sufficient nutriment for trees after they attain a certain size. Hence the cedar is usually hollow, and large healthy trees of any kind are rare. Still the valley produces fair timber, that with proper protection will remain a permanent asset to the country.

COLUMBIA RIVER VALLEY AND SHUSWAP RIVER DISTRICT.

Report by Jos. E. Ross, D.L.S., season 1907.

SIR,—In accordance with instructions, I beg to submit the following report on my survey operations in the railway belt in British Columbia during the season of 1907:—

Having instructions to make a traverse of Columbia river from a point on the Canadian Pacific railway to the north limit of the railway belt at the most suitable time during the winter, I proceeded to this work on January 17 before completing my returns of the previous season. On arriving at Beavermouth, the starting point, I found that, although there had been extremely cold weather, the river was partly open and the ice weak in places, and that there was considerable slush. The conditions indeed were not nearly so favourable as I had anticipated. There were frequent heavy snowfalls and this, together with the slush, not only made travelling difficult but also prevented us from moving our outfit on sleds or toboggans. We were compelled to resort to the primitive way of packing on our backs. In consequence some of the party quit in disgust. However, I secured more men without much trouble and continued the work. For several weeks our progress was slow, but on February 6 a slight thaw set in, the snow settled, and on again freezing, a crust formed which made travelling good and allowed us to walk on the weakest ice. From this until March 10, when I finished the work, the conditions could not have been more favourable. Although the main object was to define the limit of the belt line I also planted witness corners at the intersections of all the east and west section lines with the river, which corners, in case of future surveys anywhere along the river, can be used as starting points.

While the Columbia is winding and in places loops and islands have been formed as well as numerous back channels, the general direction is nearly northwest. At the railway the river averages five chains in width, but it gradually widens until at the head of Surprise rapids, near the boundary, it is about a quarter of a mile wide. The channel is navigable, having a depth of from six to ten feet. As the river forms the boundary between the Rockies and the Selkirks, it is needless to say that the country is generally mountainous. There are several large flats along the river, one below the mouth of Beaver river and the others at the mouths of Gold and Bush creeks, which flow into the Columbia from opposite sides. So far as seen, the middle of the flats is marshy. The timber is mostly spruce of from ten to twenty inches in diameter. On the high land the timber is fir. From the indications I would say that a considerable part of the low land is flooded in the spring and during high water in the river. There is suitable land here for a few settlers, but I do not think there is any prospect of agricultural development until conditions become more favourable in regard to transportation facilities. Possibly as timbering operations proceed and in consequence roads are made and the timber partially cleared off all the available land will be taken up.

On returning to Kamloops I finished all my returns of surveys to date, and on May 10 I commenced the general work of the season. In Salmon river and Spillimacheen valleys, which are the most important centres of the district, small surveys had been accumulating for the last four years, so I decided to confine my operations to these parts until the work was entirely completed. This occupied the greater part of the season. The greater portion of the farming land has been surveyed and taken up, but extensions are continually being made on the hills and outlying parts. In Salmon river valley the surveys were small and scattered and were at elevations of from a few hundred to four thousand feet. While the soil is fairly good the declivities and broken surface of the country render much of it unfit for anything in the nature of farming except stock-raising. The first land of any extent suitable for settlement I found in township 17, range 10, west of the sixth meridian, situated

on a low mountain about five miles long by three miles in width and at an elevation of from five hundred to fifteen hundred feet above the surrounding valley. A part of the westerly side has been taken up by an Indian reserve and provincial lots. The top is thickly wooded, with a rolling surface, but the sides are mostly open with a steep slope. There is considerable arable land with fairly good soil, but the water is alkaline and scarce. There is a wagon road built by one of the settlers to the main road from the town of Armstrong, situated about four miles to the east on the Shuswap and Okanagan railway.

In township 18, range 9, at an elevation of three hundred to four hundred feet above the main valley, there is some land suitable for settlement. It has good water and the timber has been mostly all burnt off. There is at present a thick growth of brush. A good road leads to the town of Enderby, three miles distant. Both this township and the one previously mentioned had been partly surveyed and I completed the surveys. There are also a few sections of fairly good land in township 19 of this range. Here the surface is rolling, the soil rather light, but the water is good. This land lies about midway between Salmon Arm and Enderby. The main road connecting these places runs through the middle of the survey. I completed the survey of the easterly half of this township.

I next made some surveys along Shuswap river, consisting mainly of river traverse. The sections had been mostly run out on a former survey to establish the belt boundary at Mabel lake. Some four or five squatters have gone in here recently. Besides completing the surveys needed for them I surveyed all the land that would likely be taken up. The only land that appears suitable for settlement is in the quarter sections along the river, as farther back the land is hilly and heavily timbered. There is not sufficient timber on the lands squatted on to warrant it being included in a timber berth. The greatest drawback to settlement has been the want of a good road. We had to cut our way around the worst places. The lumber companies operating on Mabel lake had been hauling in supplies for several months, and in consequence the road had been cut up in the worst possible way. The provincial Government has expended about \$5,000.00 a year on this road for the last two years. Another season's work at the same rate should put it in good condition.

The rest of the surveys were small and scattered. At 'Grande prairie' I spent several weeks making retracements and connections with provincial lots. As I was on the point of closing for the season I received instructions from you to make a number of connections between my last year's surveys and those of 1886 and 1887. I was engaged on a partial survey of these until the end of the year, when I closed field operations.

As to minerals, I may say that the country covered by me has been well prospected as is shown by the numerous location posts and prospect holes found nearly everywhere. So far the prospects are not very promising. The only mineral in quantity noticed was a deposit of gypsum in township 18, range 12, west of the sixth meridian.

Surveying the railway belt differs in some respects from the ordinary subdivision work. The country is more mountainous and broken. This is especially the case where the limit of the belt has to be defined. The sectional work is gradually becoming rougher since the main body of the agricultural lands is already surveyed. The lines have to be carried over ridges to the smaller valleys. The surveyor now is usually obliged to begin where the first surveyor considered it advisable to leave off. The starting point is often in some out of the way place at which it is inconvenient to take observations for azimuth or perhaps it is a witness corner put in at the foot of a steep rocky bluff. The extent of country covered is great, usually extending from one hundred to two hundred miles along the railway and involving work in as many as thirty townships. Much time is also taken up in making connections with Indian reserves and provincial lots as well as retracements and closing

of Dominion section lines. While making these connections, especially when in open country, the chief is by far the hardest worked man on the party.

If complete surveys of the best agricultural townships had been made at the outset it would have proved much more economical and satisfactory, but this of course could not be foreseen. This plan could not now be adopted without putting on a large force of surveyors, otherwise the work would fall behind and urgent cases could not receive attention. Your present plan of having a township, or part of one, completed when it does not entail much extra labour is a move in the right direction and possibly the best that can be done under the circumstances.

It will be seen from what has already been stated that the railway belt cannot accommodate any large influx of immigrants. The land seeker here, at present, needs to be to some extent a prospector also. If the land lies on a bench he must use his judgment and experience as to what crops can be grown successfully without irrigating; possibly he may have to locate a road, and this also requires experience, as quite often a roundabout way has to be taken to obtain a suitable grade; sometimes a switchback or loop has to be put in the road. If the land needs to be irrigated it will be necessary to investigate as to whether water can be obtained from a stream by damming or putting in a reservoir.

As the bulk of the farming lands in this district have been surveyed for some years, it was generally expected that the survey list would soon reach the vanishing point. This, however, does not appear to be the case. On the contrary, the list of surveys needed is yearly growing larger. Lands that were once considered unfit for farming are now eagerly sought after and people are gradually settling in the more remote isolated parts. Much depends on irrigation. The provincial government have had this matter under consideration and it is expected that legislation will soon be passed which will have a beneficial effect on all future irrigation works. The climate is perhaps one of the greatest inducements to settlement in this district.

The setback in business which prevailed throughout the country during the latter part of the year was marked by the closing down of the lumber camps and a few of the mines, causing many labourers to be thrown out of work with a consequent fall in wages. It is expected that this will be only temporary and that the usual industrial activity will be resumed in the spring.

A descriptive account of the land in the townships surveyed is attached hereto. My assistant, Mr. Geo. H. McCallum, gave complete satisfaction.

COLUMBIA RIVER VALLEY (North and South of Golden).

Report by M. P. Bridgland, D.L.S., dated Dec. 15, 1908.

SIR,—I beg to submit the following report upon the operations of my party in the classification of lands situated in the Columbia River valley above and below Golden, B.C.:—

The Columbia valley from Golden to the south limit of the Railway Belt is a wide valley situated between the Beaverfoot range of the Rocky mountains and the Dogtooth range of the Selkirk mountains. The summits of the mountains are in many places ten miles apart. The lowest part of the valley, varying from a mile to a mile and a half in width, consists of low, flat land, nearly all of which is under water through June, July and August. It is really a series of swamps and sloughs through which the river finds its way by many different channels. On either side of this flat, steep bluffs rise from 300 to 500 feet above the river level, and beyond a series of benches run back to the base of the mountains.

Of the bottom lands practically all of the small area not liable to be flooded has been taken up by settlers. The remainder, which is all slough and swamp, is at present of no use except for pasture in the fall and winter. This land, if it could be

reclaimed by dyking or dredging, would make the best farm land in the valley. It would probably be too wet and cold for fruit farming, but for vegetables, grain and hay it could not be beaten.

On the southwest side of the river the benches are very rough and broken, the soil is stony and there are frequent rock outcrops. There are some areas of good land, but they are so small and scattered that I do not think that they are of any value, and in most cases there is no chance of irrigating them. The greater part of this side is old brule overgrown with poplar, willow, small jackpine and fir. In township 27, range 22, there has been no fire, but all the good timber near the river has been taken off. There is, however, much new timber growing up, and good timber, principally spruce, remains near the base of the mountains.

On the opposite side of the river the benches are not nearly so rough or stony; but they are more or less broken, and it is very hard to say which are or are not too rough for cultivation. Directly above Golden the benches are narrow and rough, but they start to widen in the south part of township 26, range 21. From here through township 25, ranges 21 and 20, and township 24, range 19, they continue wide. In township 23, range 18, the valley again narrows and there are no benches of any importance.

The soil throughout seems to be very much the same, a mixture of red, sandy loam and clay with a subsoil of gravel and in some places a white clay. These benches are covered principally by small fir, jackpine and poplar and, where at all open, there is an abundant growth of pine grass often mixed with pea vine. Near the base of the mountains there are many small streams which soon sink below the surface, and these could be used for irrigation. As those streams would be at their highest in June and July, when the water would be most needed, nearly all the land of value could be irrigated, if any systematic attempt were made to do so.

To the north of Golden, in township 27, ranges 21 and 22, there are about four square miles of good bench land. The soil is very much like the other, a red, sandy loam with a gravel subsoil. The whole is overgrown with poplar, small fir and jackpine. The soil itself is good, and there are large benches comparatively unbroken, but which it would be very difficult to irrigate.

There is very little good timber on the east side of the valley, and what there is consists mostly of scattered fir along the top of the hills. Most of the merchantable timber has been cut off, leaving only a few trees here and there. There is some good timber in sections 25 and 36, township 25, range 21, and sections 30 and 31, township 25, range 20, also in the northeast quarter of section 15, southeast quarter of section 22 and southwest quarter of section 21, township 24, range 19 (parts of Timber Berth 421 (3) and Timber Berth 278). Outside these sections there is very little timber of value on the lands examined.

Up to the present time there has been no attempt to cultivate any of the benches. The lands are harder to reach and harder to irrigate, so the settlers seem afraid to risk anything by trying them. Opinions differ widely as to their utility. Some settlers claim that the best land is on the benches, and others state just as confidently that they are of no value. Much of the soil, however, seems to be as good as that in the valley, and would probably be more suitable for fruit-growing.

Fruit farming has not been extensively tried in the valley. Some farmers have had apple trees planted for some years, and, while many of the trees are in good condition many others have been killed. There is no doubt that many of those killed could have been saved by a little care. The season is short, and a winter apple such as the Northern Spy will not mature. The Wealthy and the Duchess seem to be two of the varieties that do the best. The trees bear heavily every year and this tends to make the trees short-lived and also to produce an inferior class of fruit. Plums and cherries have been tried, but with poor success. Small fruits such as strawberries, gooseberries and currants have yielded most abundantly wherever tried.

The climate in this section is a very moderate one. Snow falls early in November and remains till spring, affording excellent protection for trees and plants. The snowfall is not very heavy, as many of the settlers south of Golden winter their stock in the marshes and seldom have to do any feeding. In the summer the nights are nearly always cool, although the days may be hot. In July and August the temperature ranges from 70 degrees to 90 degrees Fahr. during the day, but at night it falls to 40 and 50 degrees Fahr.

A schedule giving a general description of the lands examined by section and quarter section is submitted herewith.

SIR,—I beg to submit the following report concerning the lands examined in the Columbia Valley below Golden:—

The land examined is situated chiefly in township 28, ranges 22 and 23, township 29, range 23, south of the Columbia river, and in township 30, ranges 23 and 24, north of the river. On the west side of township 29, range 23, the valley narrows, and there was not time before winter set in to carry the work beyond this point.

Between Golden and Donald there is a large area of bottom land along the base of the hills, and between the different channels of the river. Most of this would make good hay land, although unless drained, much of it would be too wet for grain.

On the south side there are wide benches running back to the mountains, but in many places these are very stony and broken badly. There is some good agricultural land, but on the whole it is very poor. A short distance back from the river there is much good timber, chiefly spruce and fir, but nearly all of it immediately above the river has been taken off. It is all included in Timber Berths 15, 14 and 19.

In the southwest part of township 30, range 23, and the southeast of township 30, range 24, north of the Donald Forest reserve, there are about four sections of rolling bench land covered with small poplar, willow, spruce, fir and jackpine. This area would make good farm land if not too dry, but it could not be irrigated. There is no large timber on this land, but further north there is some good spruce, nearly all included in Timber Berth 20.

Further west in township 30, range 24, all the land examined lay along the valley of the Blackwater. There are some large beaver meadows along the river bottom and some smaller ones on the benches above. The benches slope gently to the southwest and are not badly broken. Nearly all of this section could be cultivated and, if necessary, easily irrigated. There is much fine timber, large spruce and fir with some pine and cedar up to 30 inches in diameter, all of which is included in Timber Berths 20 and 47.

The soil throughout is of very much the same nature, the mixture of red clay and loam with a good deal of gravel. The best soil is in the bottom lands of the Columbia river valley and along the valley of the Blackwater. On all the benches above the Blackwater there is considerable gravel, but not enough to render them unsuitable for cultivation.

A schedule giving a general description of the lands examined by sections and quarter sections is submitted herewith and also a schedule of areas according to the colors shown on the accompanying map.

COLUMBIA RIVER VALLEY (North and South of Golden).

Report by M. P. Bridgland, D.L.S., dated February 18, 1909.

Townships included in following report:—Range 18, Township 23, 24, West 5th Mer.; Range 19, Township 23, 24, 25, West 5th; Range 20, Township 24, 25, West 5th; Ranges 21, Township 25, 26, 27, West 5th; Range 22, Township 26, 27, 28, West 5th; Range 23, Township 28, 29, 30, West 5th; Range 24, Township 30, 31, West 5th; Range 25, Township 30, 31, West 5th.

SIR,—I have the honour to submit the following report concerning the operations of my party in the Columbia valley during the season of 1908:—

The party arrived in Golden on July 18, and commenced work by looking over the land north of Golden and Kicking Horse river and east of Columbia river. This required one week, and then the work was continued southerly along the east side of Columbia river, baggage being transported by pack train. From July 26 till September 9 all the time was spent along this side except two days, on which photographic stations were occupied on the west side of the river, one above Carbonate landing and another at Jubilee mountain near the south limit of the railway belt, to complete the topographical survey of the eastern side of the valley. The weather throughout was fine and warm, and not much time was lost.

From September 10 to September 27 the lands along the west side of the Columbia between the south limit of the railway belt and Canyon creek were examined. As much of this section was very rough, comparatively little time was spent over it. On September 12 a third photographic station was taken midway between the two previously mentioned. From September 28 to October 23 the work was continued down the west bank of the river to the west boundary of township 29, range 23, near Donald station. Several days were lost during this period owing to heavy rain and snowfalls. Throughout all the work on this side of the river a canoe rented from Mr. Dainard, of Golden, was used for moving camp, and was often of use going to and from work.

From October 29 to November 12 work was very much delayed by rains and heavy snowstorms. About four square miles north of the Donald Forest reserve and east of Bluewater river were examined, and then the work was continued up the valley of the Blackwater to where it becomes narrow. This section was finished on November 12, and on November 13 the party started for Golden, reaching there the afternoon of the 15th.

GENERAL INFORMATION.

The Columbia valley in the vicinity of Golden is wide, lying between the main range of the Rocky and the Selkirk mountains. Above Golden the lowest part of the valley, varying from a mile to a mile and a half in width, consists of low, wet land, nearly all of which is under water through June, July and August. It is really a series of swamps through which the river flows by many tortuous channels. On the other side of this flat, steep bluffs rise three hundred to five hundred feet above the river level and beyond, a series of benches run back to the base of the mountains. Between Golden and Donald the formation of the valley is the same, but the bottom is not so wide and not so swampy.

The land may be divided roughly into two classes, bottom land and bench land; the term bottom land is applied to that part on or near the same level as the river, and bench land to that part lying between the bottom land and the base of the mountains.

Of the bottom lands practically all of the small area not liable to be flooded has been taken up except about 3,000 acres between Golden and Donald. The remainder, which is nearly all slough and swamp, is at the present time of no use except for pasture in the fall and winter. This land, if it could be reclaimed by dyking or dredging, would make the best farm land in the valley. It would probably be too wet and cold for fruit farming, but for vegetables, grain and hay it would be excellent.

On the southwest side of the river the benches are mostly rough and broken and the soil stony, with frequent rock outcrops. It is red clay with much rock, shale and gravel. There are some areas of good land, but they are so small and scattered that they would not be of any great agricultural value, and in most cases where the land is best it would be very difficult to irrigate. The greater portion of this side, south of Golden, is old *brulé* overgrown with small poplar, willow, jackpine and fir. Between Golden and Donald there has been no fir, but all the good timber close to

the river has been taken off. There is, however, much new timber growing up, and good timber, principally spruce and fir, remains near the base of the mountains. This is all included in Timber Berths Nos. 14, 15, 16, 17 and 19.

On the west side of the river, between Golden and the south limit of the railway belt, the benches are not nearly so rough and stony, but they are more or less broken, and it is very hard to say which are or are not too rough for cultivation. Directly above Golden the benches are narrow and rough, but they start to widen in the south part of township 26, range 21. From here through township 25, ranges 21 and 20, and township 24, range 19, they continue wide. In township 23, range 18, the valley narrows, and there are no benches of any importance. To the north of Golden, in township 27, ranges 21 and 22, there are about four square miles of good bench land, much of it not badly broken. This would make excellent land if it were not too dry, but it would be very difficult to irrigate it.

The soil throughout seems to be of a very similar nature, a red sandy loam or clay, usually with a gravel subsoil or occasionally a white clay. These benches are covered principally with small fir, jackpine, poplar and willow, and when at all open there is an abundant growth of pine grass often mixed with peavine. Near the base of the mountains south of Golden there are many small streams which soon sink below the surface, and many of these could be used for irrigation; as these streams would be at their highest in June and July, when the water is most needed, nearly all the land of value could be irrigated if any systematic attempt were made to do so.

There is very little good timber on the east side of the valley, and most of what there is consists chiefly of scattered fir along the brow of the hills above the river. Most of the merchantable timber has been cut off, leaving only a few trees here and there. There is some good timber in sections 25 and 36, township 25, range 21, and sections 30 and 31, township 25, range 20, and also in the northeast quarter of section 22 and the southwest quarter of section 21, township 24, range 19, consisting of parts of Timber Berth No. 421 and Timber Berth No. 278.

In the southwest part of township 30, range 24, north of the Donald forest reserve, there are about four sections of rolling bench land covered with small poplar, willow, spruce, fir and jackpine. The soil here is a red clay loam, and should make good agricultural land if not too dry, but it could not be easily irrigated. There is no large timber on this land, but farther north there is some good spruce included in Timber Berth No. 20.

Farther west in township 30, range 24, all the land examined lay along the valley of the Blackwater, 500 feet and upwards above Columbia river. There are some large beaver meadows along the river bottom and some smaller ones on the benches above. The benches, from one mile to two miles in width, slope gently to the southwest, and are not badly broken. The soil is a red clay containing considerable gravel, but not enough to render it unsuitable for cultivation. Most of this section could be cultivated and, if necessary, easily irrigated. There is much fine timber, consisting of large spruce and fir, with some pine and cedar, up to thirty inches in diameter, all of which is included in Timber Berths Nos. 20 and 47.

Up to the present time no attempt has been made to cultivate any of the benches. The lands are harder to reach and harder to irrigate, so the settlers seem afraid to risk anything by trying them. Opinions differ widely as to their utility. Some of the settlers claim that the best land is on the benches, and others state confidently that the benches are of no use except as pasture lands. Much of the soil seems to be as good as that which they are working in the valley, and would probably be more suitable for fruit growing.

Fruit farming has not been extensively tried in this valley. Some farmers have had apple trees planted for several years, and while many of the trees are in good condition, many others have been killed. There is no doubt that many of the latter could have been saved by a little care. The season is short, and a winter apple such

as the Northern Spy will not mature. The Wealthy and Duchess seem to be two of the varieties that do best. The trees bear heavily every year, and this tends to make them short-lived and also to produce an inferior class of fruit. Plums and cherries have been tried but with poor success. Small fruits such as strawberries, gooseberries and currants have yielded most abundantly wherever tried.

The climate here is a very moderate one. Snow falls early in November and remains until spring, affording excellent protection for trees and plants. The snow-fall is not very heavy, and many of the settlers south of Golden winter their stock on the marshes and seldom have to do any feeding. In the summer the nights are nearly always cool although the days may be hot. During July and August, 1908, the maximum temperature ranged from 70 degrees to 90 degrees Fahr., and the minimum from 40 degrees to 50 degrees Fahr.

A table showing the maximum and minimum temperatures for the time of the survey is submitted herewith; also a schedule of descriptions of the various classes of land by section, township and range has been forwarded to the Department.

COLUMBIA RIVER VALLEY (North and South of Revelstoke).

Report by H. G. Wheeler, D.L.S., March 12, 1909.

Townships included in the following report:—Range 29, township 21, 20, West 5th; Range 1, township 21, 22, West 6th; Range 2, township 22, 23, 24, 26, 27.

SIR,—I beg to submit the following report of my survey work in the Columbia valley, north and south of Revelstoke, during the season of 1908.

On arrival of my party at Revelstoke, July 19, we proceeded at once to a camp near Four-mile siding on the Revelstoke and Arrowhead branch of the Canadian Pacific railway. Some time was spent here owing to the considerable amount of good land in the vicinity. Work was pushed southward from this camp, but was slow and difficult owing to the swampy and drowned land, the excessive amount of large fallen cedar and the dense growth of devil's club and thick undergrowth.

On August 19 Wigwam siding was reached. Bad weather compelled a stay here until August 26, when camp was moved on towards the Railway Belt boundary, the south limit of it being reached on August 31.

A return was now made to Revelstoke and, upon the arrival of a row-boat hired at Arrowhead, we took steamer up the Columbia to Nineteen-mile flat, where the only settler north of Revelstoke lives, by name James Hathaway. Work was conducted in the vicinity until September 23, being carried north to the limit of the Railway Belt. The steamer was then again boarded and a return made to the foot of the Petites Dalles canyon. From this point work was carried downwards on the west side of the river until the south limit of the Railway Belt was reached on November 14. My party was paid off on the 19th.

Through the kindness of Mr. T. Kilpatrick, superintendent of the Canadian Pacific Railway Company at Revelstoke, I was given special facilities for moving my camp along the Revelstoke and Arrowhead branch, and conducted the work on the west side of the river by flying camps, using the boat for crossing. North of Revelstoke, excepting the trips up and down by steamer, the boat was used entirely for moving camp and the purposes of the work.

GENERAL INFORMATION—SOUTH OF REVELSTOKE.

South of Revelstoke the valley of the Columbia river is a trough with a width of from one to one and a half miles at its floor and about 9 miles from crest to crest of the ridges forming its perimeter. The altitude above sea-level ranges from 1,500 feet at Revelstoke, to 8,900 feet at the summit of mount Begbie, the highest crest along the valley's rim.

AGRICULTURAL AREAS.

The available agricultural area consists of bottom lands and benches extending back from the river, with a maximum elevation of a few hundred feet, to the steep mountain sides. The bottom lands are low, rising but a few feet above mean water level, and a large percentage is overflowed at high water. The result is that a portion of this overflow remains in the hollows throughout the summer, and swamps are formed, thus giving to considerable areas a condition of excessive moisture. Owing to the slight elevation above the main river bed these low areas are, moreover, intersected by numerous channels for the high water flow that, at low stages of the river, carry dead water or a very sluggish current and add to the diffusion of moisture through percolation, rendering the soil cold and wet. The portion of the bottom land that is subject to yearly overflow, and where water rests in these swamps, is covered by willow brush and grown with reeds, sedges and coarse grass. It is questionable whether, owing to the slight elevation above the river if it would be possible to reclaim this land sufficiently to convert it into pasture and hay land. Much, however, might be done by dyking and allowing the surplus water to run off instead of collecting in the hollow. Owing to the peculiarity of streams like the Columbia river, where the difference in extremes of water level is great (in this case about 20 feet) and very large quantities of silt are carried, the land along the banks is often higher than that farther back, through the silt being piled up along the edges of the bed, and by this means a river may rise its bed above the level of the surrounding country. In such case it would seem impossible to reclaim these overflowed lands. An approximate area for them is set at 3,912 acres.

Beyond the bottom lands, in some instances, benches are found rising back in steps to the steep mountain sides; in others the mountain slopes rise directly from the bottom lands. It is on these bench lands that farming and fruit growing will likely be carried on most successfully. But even here, owing to the intense heat in the valley during the summer months, it is doubtful whether a full measure of success can be attained without the assistance of irrigation, the water supply for this purpose is not always attainable. The greatest height above the river at which agricultural bench land was found was 700 feet, and in most cases it was considerably lower. As a rule the mountain slopes rise swiftly and are steep and rocky. While such slopes might be found suitable for the growth of small fruits, it is unlikely that fruit trees of the larger variety could be grown successfully.

SOIL.

The soil generally is a light sandy or clay loam with a sand or gravel subsoil. An alluvial deposit of silt is found near the river. In the low parts the alluvial deposit is overlaid by a rich vegetable mould. Near the mountain slopes gravel and stones become apparent while parts of the higher benches are often rocky. The soil is very fertile and seems well adapted to fruit growing, vegetable farming and generally to agricultural purposes. Owing to the natural heat in the valley during the summer, combined with the moisture of the lower ground, an almost tropical luxuriance of growth is produced, resulting in an impenetrable jungle on the flats, which, while it is the very best evidence of the productiveness of the soil, forms a highly detrimental factor to the utilization of the land for agriculture on account of the excessive cost and labour to clear it.

TIMBER.

Owing to the climatic conditions and the abundance of moisture in the valley bottom caused by the yearly overflow from the river at high water the forest growth flourishes exceedingly, and immense quantities of excellent cedar and hemlock have been and are still being obtained for manufacturing purposes.

The prevailing species of merchantable value are cedar and hemlock and these are met with on every side, in the case of the former to as much as 6 feet diameter.

Cedars cut along the right of way of the railway have been seen to measure 12 feet across the stump, but at this size they are mere shells, the whole interior being eaten up by dry rot.

There is much good timber on the west side of the river, seen on the slopes of the valley in extensive patches. On the east side, while there is a scattering of good timber throughout, it has been pretty well logged over, and what is left is difficult of approach. Several good patches back on the benches and near the limit of the Railway Belt are still practically untouched.

Of the other species, cottonwood, poplar, birch and jackpine are most apparent, together with thick undergrowth of maple, alder and willow.

CROPS.

The land in and about Revelstoke is well suited for vegetable farming, and this is a great source of revenue to the settlers. All classes of vegetables will grow to perfection, except those requiring very much sun, such as corn, tomatoes, etc.

Of other kinds of farming, hay seems to be the principal source of revenue. For this purpose the low bottom lands and over-flowed lands may furnish a good base. The latter are better adapted to it than to pasture lands for the reason that it is only for a month or a month and a half before the snow comes that they are sufficiently dry to admit of cattle roaming over them. In October, a short distance back from the railway, I came to a hay meadow. The hay was three or four feet high and I walked across it right to the mountain slope. In July I had crossed the same ground on a raft. I did not see grain growing to any appreciable extent.

The principal large fruit grown in the valley are apples; being hardy, they seem to thrive best. On visiting H. F. Hayes, one of the most successful growers, last fall, he showed me a wonderful display in his orchard. The trees were breaking down with fruit. The species bearing best were: Alexander, Stark, Wealthy, the Duchess, Gravenstine, Mackintosh Red and Snow. Plums do not do so well, as they require much more care and the fruit does not ripen so readily. Near Revelstoke, however, some fine specimens were seen, and it is possible that in the future when fruit growing, which is now only in its infancy in these parts, becomes more general, plums, peaches and pears will all be grown with success.

Most of the fruit trees have been set out for only a few years, and while all the young trees seem to be doing well, it is still soon to speak of fruit crops in the vicinity as an assured success.

Wild fruits such as raspberries, strawberries, huckleberries and Saskatoon berries grow in the greatest profusion and mature perfectly. This would indicate that the tame varieties can be grown with equal success, a surmise borne out by the fact that strawberries grown in Revelstoke last summer carried off first prize at the Agricultural Exhibit at Salmon Arm. Moreover, on Williamson's ranch, adjoining that of H. F. Hayes, small fruits are now being grown extensively and successfully. It would seem possible that the sunny lower mountain slopes beyond the bench lands, where the soil is always inclined to greater moisture, could be utilized to advantage in this manner.

Some of the settlers have planted out fruit trees in their holdings on the bottom lands, but it is still a matter of question whether the soil here will not be found too cold and wet to allow the fruit to ripen to perfection. All the successful fruit growing done so far has been on the high and dry bench lands, where artificial watering by irrigation has been possible.

ISLANDS.

In the Columbia river bed south of Revelstoke there are a number of Islands. These are all, with perhaps two or three exceptions, practically unfit for cultivation, being below the high water level of the river, and of small area. The two or three referred to are covered by a heavy growth of cedar and hemlock and still contain trees of lumber value. The others are timbered with large poplar and cottonwood, cotton-

wood and willow brush and scrub. It is possible this timber may have a pulpwood value for the future. Very few of the islands were seen with a natural growth of hay to any extent, but possibly they could be used for that purpose.

SETTLERS.

Those holding homesteads are industrious and hard working. Being sure of their holdings, they do not hesitate to cultivate the land and to lay out what little capital they have. On the other hand, the squatter is always in a state of uncertainty, not knowing who may reap the reward of his labour. Some of them work hard and deserve consideration. Their one cry is to have the lands under timber lease, upon which there is no merchantable timber, or insufficient to be worked advantageously, released, so that they can get their homestead entries. This is a general complaint throughout the district.

Of late years a number of Italians have been taking up holdings in the valley south of Revelstoke, not very far from the town. They make good settlers, work every bit of the ground to advantage and raise good crops. They are very poor, and on this account are not at a disadvantage. They have, however, large families and will soon very materially increase the area of land under cultivation.

MOSQUITOES.

It seems somewhat absurd to introduce these pests in a report of this nature; and yet they form an evil of considerable magnitude in the valley of the Columbia river south of Revelstoke. The fact that it has been satisfactorily disposed of in other countries infested by them proves that it is not a necessary one for all time. As the country clears up, undoubtedly, the evil will be mitigated, but so long as the tracts of swamp land remain as such they will be favourite breeding grounds. It is difficult for people who live in localities where their numbers are few to understand the four months of torture that is endured here by the settlers every summer. No doubt when the settlers increase sufficiently in number, the matter will be taken in hand and the scientific application of kerosene to the swamps put an end to what is now a serious plague.

At the present time Revelstoke furnishes the principal market for the agricultural produce of the valley, but with the facilities offered by the Arrowhead branch of the Canadian Pacific railway and that company's line of steamboats on the Arrow lakes there seems a good outlet for trade with the cities and towns springing up in the lower Kootenay country; while, when the fruit crops become of sufficient magnitude, there will undoubtedly be a market for them both east and west.

GENERAL INFORMATION—NORTH OF REVELSTOKE.

North of Revelstoke the conditions are somewhat different. The valley is much narrower and the river very rapid and difficult to navigate. It flows for the most part between high banks, and is often broken by rapids. Owing to the compressed volume of the stream the difference between high and low water is great and here has an average of 20 feet, while south of Revelstoke the average is about 15 feet. The mountain slopes are very precipitous and rocky, especially so on the east side.

AGRICULTURAL AREAS.

There are no bottom lands, and the land suitable for agricultural purposes consists of benches rising back in steps to the steep mountain sides. They are at an elevation of from 40 to 500 feet above the river. The available area is small. It is estimated at 3,477 acres, of which probably not more than 50 per cent is fit for cultivation. While there are some level flats, the bulk of the bench land is rolling and uneven.

SOIL.

The soil, generally speaking, is either a rich black loam with a sand subsoil or a rich sandy loam with gravel subsoil, although there are variations from this rule. It is very stony in parts. Taken as a whole, it is well suited for agriculture and particularly for fruit growing.

TIMBER.

The prevailing timber of merchantable value is hemlock and cedar. The latter is seen to 6 feet in diameter. There are millions of feet on the slopes along the west side of the valley. There is also a considerable quantity on the east side, but a good deal of it has been taken off to supply the mills operating at Revelstoke. On both sides of the river it is completely covered by timber licenses. For the rest, cottonwood is found along the tributary streams and in low places and jack pine in sandy spots; while second growth of cedar, cotton wood, hemlock and pine is met with in the old *brulé*.

SETTLERS.

The only settler on undisposed of lands north of Revelstoke, by name James Hathaway, lives on the NW. $\frac{1}{4}$ of sec. 10, township 26, range 2, west of the 6th meridian, at a place locally known as Nineteen-mile flat.

CLIMATE.

The climatic conditions in the Revelstoke vicinity are exceptional. Owing to the low altitude, about 1,500 feet above sea-level the coming of spring is comparatively early, and the setting in of winter late, making a full period for growth and maturity. In addition, the warm chinook effect found in wide valleys bordered by high mountain ranges is apparent here. This, together with the large amount of evaporation from the great body of water flowing through the valley, adding humidity to the highly-heated summer atmosphere, renders the climate an ideal one for the practice of farming and fruit growing.

In the winter from 3 to 5 feet of snow covers the ground and remains steadily until the spring, thus affording the best possible protection to fruit trees and a good supply of moisture for the summer. The mean average precipitation is about 35 inches. The valley is perfectly sheltered, and there is practically no wind that is to any degree detrimental.

During July and August the maximum temperature ranged from 57° to 94° F., and the minimum from 43° to 60° F.; during October and November the maximum ranged from 31° to 69° F., and the minimum from 20° to 50° F. The first frost came on the 23rd of September when it registered 31°. On the 25th it registered 30° and on the 26th 29°. On the 4th of October it registered 31° and the next frost did not occur until the 16th of October. The September frost was unusual, and was universal throughout the mountain regions.

Attached hereto is a schedule giving a short synopsis of the sections and quarter sections examined, stating in general terms the character, the altitude above the river, the soil, the timber and the quality as agricultural land.

Accompanying the report is a map showing by colours the two classes of land that have been examined and are considered suitable for cultivation and agriculture.

Dark grey represents bottom lands or low-lying lands nearly on a level with the river and rising back imperceptibly therefrom. --These are of two classes, viz., lands subject to overflow at high water and those not overflowed. In the annexed schedule of areas the approximate acreage of each class is given.

Yellow represents bench lands or lands more or less in the nature of a plateau, rising back in steps from the bottom lands to the steep mountain slopes, at varying heights above the river.

Timber leases are outlined in green.

The lands not shown as above are either unsuited for cultivation, or are disposed of.

The names of squatters have been written on the respective lands upon which they have squatted.

In addition, there is also annexed a schedule of areas according to colours shown on the map and a table of maximum and minimum temperatures from July 21 to November 17.

All elevations are referred to the Columbia river. According to James White, Geographer of the Department of the Interior, extreme high water at the crossing of the Canadian Pacific railway is 1,450 feet, and low water 1,432 above sea-level. The fall of the river bed between this point and the south limit of the Railway Belt is approximately 40 feet. Between the point named and the north limit of the Railway Belt the fall is unknown, but is probably much greater as the flow is very swift and broken by rapids.

SHUSWAP LAKE DISTRICT.

Report by A. O. Wheeler, D.L.S., December 23, 1908.

Townships included in the following report:—Range 7, township 23, 24, 25, 26, West 6th; Range 8, township 21, 23, 24, 25, 26; Range 9, township 22, 23; Range 10, 22, 23; Range 11, township 22, 23.

SIR,—In accordance with instructions received from the Surveyor General of Dominion Lands, dated April 9, three survey parties were placed in the field, under my direction, to commence the classification of lands within the Railway Belt of British Columbia. One in charge of Mr. M. P. Bridgland, D.L.S., operated in the valley of the Columbia river, up and down from Golden. Another in charge of Mr. H. G. Wheeler operated in the Columbia valley, up and down from Revelstoke. The third, in my own charge, operated in the district surrounding Shuswap lake.

For the purposes of agriculture, the climatic conditions of the Columbia valley render it of very special value, on account of their mildness and humidity. The vapour currents crossing the North American continent from the Pacific ocean, on reaching the highlands of the Gold and Selkirk ranges, rise and, cooling rapidly, deposit their moisture along these watersheds. Then sweeping swiftly downwards into the valleys below become heated and a chinook effect is produced which creates a climatic condition particularly adapted to the successful cultivation of fruits, vegetables and fodder crops. Joined to this, the humidity and mildness of temperature produced by the large body of water flowing and spread out, in the form of lagoons, in the Columbia valley, renders it of special value for the purpose named. This is shown by the tropical luxuriance of growth of the natural flora and the abundance of small wild fruits that may be found.

The swift-flowing river, fed by hundreds of silt-laden mountain torrents has, through the course of its long career, carved a way from level to level, creating terraces of bench-lands and piling up alluvial flats, now densely timbered. It is these flats and benches that will, when cleared and made fit for cultivation, be found a mine of wealth replacing the great wealth that now stands upon them in the large tracts of magnificent merchantable timber with which they are still clothed in many localities.

The tropical growth of cedar, Douglas fir, spruce, hemlock and minor vegetation in the Columbia valley is more apparent above and below Revelstoke than above and below Golden, for two reasons: (1) the precipitation on the western slopes of the Selkirks is greater and (2) the valley is at a lower altitude. This abundance of moisture, in conjunction with the tropical heat of the sun, intensified in the deep trough of the valley, tends to produce the luxuriance of flora here found. The same

effect, though not to so great a degree is seen above and below Golden. The causes that have produced such a magnificent natural growth will be found equally beneficial in the interests of the settlers who are now making their homes in the valley.

Notwithstanding, it is doubtful whether cultivation on the bench lands can be brought to a high state of perfection without the artificial application of water, for the great heat in summer, so efficient in the maturing of growth, dries out the soil and counteracts its own influence. This condition is more clearly apparent in the Columbia valley near Golden. In the interests of irrigation to these bench and bottom lands, the action of the Department of the Interior in setting aside as reserves large timbered areas along the watersheds of streams available for such purposes can readily be understood and appreciated.

In the Shuswap Lake district conditions are different. The lake stretches out in a number of narrow arms, lying in the deep mountain troughs, resembling fjords. As an almost invariable rule, there is a sharp ascent from the water's edge, which either continues directly up the mountain side for two or more thousand feet, or leads to a bench land or series of bench lands gradually merging with the steep slopes of the mountain. Flats that can be designated as bottom lands are few and are generally found at the mouth of the larger tributary streams where they have, through the course of ages, either filled in the ends of the arms or pushed deltas out into them.

The lake is practically divided into two parts by the Cinnemousun narrows—less than half a mile wide. On the east side lie Anstey arm reaching northeasterly, the main body of the lake from the narrows to Sicamous and Salmon Arm branching westerly from it at the southern end. On the west side are: Seymour arm, reaching farthest north and slightly beyond the limits of the Railway Belt; then the main body of the lake, extending westerly from the narrows and known as "The Long Traverse." From its farthest extremity the South Thompson river flows westerly to Little Shuswap lake and from that to Kamloops lake.

At the western end of Salmon arm, entered by the river of that name, a very minor stream, there are considerable areas of very excellent land well under cultivation and producing some fine orchards now bearing quite extensively a first-class grade of fruit. Practically all the available land fit for cultivation on this arm is disposed of. At Sicamous two streams enter the lake: Eagle river from the summit of the Gold range, and Shuswap river, the outlet of Mara lake, one of a chain of lakes reaching southwesterly from Shuswap lake. There are still available agricultural lands lying in the valley of Eagle river, but the choice parts are disposed of.

Excepting for a few hundred acres of doubtful utility on Canoe point, at the northeast corner of Salmon arm, there are no undisposed of agricultural lands between Sicamous and the Narrows. On Canoe point there are several quarter sections for which entries have been given, where fruits, large and small, are now being grown with varying success.

It is a peculiarity of this form of lake that where mountain torrents enter they form a small fan-shaped delta, containing, as a rule, a few acres of land that can be cultivated, generally stony. On two of these on the Sicamous stretch, houses have been built and are lived in during the summer.

At the head of Austey arm there is a flat extending a short distance northward to Hunakwa lake, a small sheet of water at one time, without doubt, part of the Arm. The best portion of the flat is included in a provincial grant of 320 acres. The balance is covered by timber berth 241. There are some bench and high lands at the back and east side of the flat, but not of very large area. Most of the remaining possible lands on Anstey arm are bench and high lands varying in altitude from 100 to 1,200 feet above the lake.

There are very few bottom flats on Seymour arm within the Railway Belt, perhaps 1,200 to 1,500 acres of good land in all, extending southward to Hunakwa lake. but a considerable portion of it is under timber license. This area slopes gently to Hunakwa lake, being elevated towards the Seymour arm end. There is a small flat

at Celista creek, again under timber license; and for the rest, there are only bench lands and high lands, more or less difficult of approach on account of the steep ascent immediately adjoining the lake.

At Cinnemousun Narrows a small area is found on both sides that could be cultivated if not too arid when cleared.

Along the south side of the Long Traverse, bench and high lands are found for about 12 miles. This area is rough and broken and only moderately well watered. It is of somewhat doubtful utility. At the west end of the tract, however, in sections 3, 4, 5 and 6 of township 23, range 9, is a patch of some hundreds of acres that can be cultivated to advantage and has no timber of merchantable value upon it. This will undoubtedly be settled as soon as surveyed, for there are already three squatters upon it.

Farther west, at Blind Bay, on the slopes of Notch hill, in township 22, range 11, there is now a progressive settlement, with almost every quarter section occupied between Shuswap lake and the Canadian Pacific railway to the south. The settlement is now spreading easterly across White creek into township 22, range 10. There is some good land in the vicinity of White lake which was covered by valuable timber. Unfortunately, during the past summer, a considerable quantity of this timber was burned by forest fires, entailing a very heavy loss, not only in timber but of outlay to the lumber company leasing it. Intending settlers have now posted notices in prominent spots through the woods, stating that they have applied for entry on certain quarter sections. Most of the land has been surveyed, but the surveys do not extend to the eastern end of the lake, where some suitable land may be found. West of the centre line of township 22, range 11, in the Blind Bay settlement, all choice land is disposed of by entries that have been granted. During the past summer a number have been given east of the same line.

On the opposite side of the lake a new settlement has sprung up in the vicinity of Meadow, Manson and Ross creeks. Every available quarter section has been squatted upon, most of the settlers having wives and families. This tract of land has been surveyed in part and it is only where the surveys have not extended that it is unoccupied. There is a post office named 'Celesta,' a school is in contemplation, which will be needed for already four children have been born in the settlement, and the government has recently cut out a road through the length of it, although I understand that at present only one squatter has received an entry, viz., H. A. Fowler, who has been on his land for fifteen years. The settlement is in township 23, ranges 9 and 10. The reason no entries have been given is that the entire tract is covered by one of those large reserve areas within which lumber companies are given the right to select blocks of timber. The same restriction applies to the Blind Bay settlement. In the natural condition of things the land which grows the best timber is that most suited for cultivation and, consequently, there is bound to be a clash between the two interests, apparently the only practical remedy being the removal of the timber.

West of the centre line of township 22, range 11, on the south side, and of Celesta settlement on the north side, with the possible exception of a few very minor areas, the land available for agricultural purposes at this end of Shuswap lake is either covered by Indian reserves or has been disposed of.

At the head of Seymour arm also a settlement is beginning. Several quarter sections have been squatted upon and for one entry has been given. One of these people brought in his wife and family during the fall.

These settlements have communication with the railway and sources of supply by means of gasoline launches which cover long distances of water with great ease and speed. While every settler has his old-fashioned boat, there are always one or more launches ready to supply his needs. There are also a number of steamboats plying on the lake in connection with lumber operations.

Camping at the Narrows one notes with surprise the amount of travel to and from this wilderness of forest, rock and water, by incoming settlers, by lumber interests,

by prospectors and by holiday trippers, sportsmen and artists, for the excellent fishing and delightful scenic beauties of the lake attract attention in many quarters.

It is a great pity that more land suitable for cultivation is not found surrounding Shuswap lake, for the climatic conditions are ideal. Not only does the extended lake surface act as a reflector to radiate heat rays, while disseminating moisture, during the summer, but it retards the approach of winter, owing to the time the heated body of water takes to cool. During the past season maximum and minimum temperatures were taken daily of the atmosphere, and of the lake during the months of October and November. On the 14th of October, the second reading of the lake, taken at 7.15 a.m., the thermometer stood at $38\frac{1}{2}$ degrees F., while the temperature of the lake was 53 degrees F. On the 24th of November, the last reading, at 8.50 a.m., the thermometer stood at 39 degrees F., when the temperature of the lake was $45\frac{1}{2}$ F.

The effect produced by the heated vapour from the water surface rising into the cold atmosphere of the fall is very interesting.

Every morning the trough of the lake is filled with a dense mass of cloud reaching down to about 1,200 or 1,500 feet above the surface. This represents the height at which condensation takes place and would suggest the altitude to which the lake influence would extend for the purposes of cultivation. In a few hours the sun breaks up this vapour zone and fills the valleys with most fantastic cloud-shapes, showing picturesquely against the forest-clad sides of the mountain spurs.

Readings of the aneroid barometer were also taken at the several camps every two hours for the purpose of ascertaining the barometric pressure of the atmosphere and of correcting the barometers used while at work, for fluctuation of such pressure.

The climate of the lake, moreover, is subject to local variations. I have known it to rain all day on Anstey or Seymour arm while on the Long Traverse the sun shone and no rain fell. In the same manner it would rain at Sicamous and be quite fine a few miles distant on Salmon arm. These diverse conditions are due to the varying narrowness of the several troughs of the lake and the direction in which they lie, furnishing greater or less facility for the sun to reach their depths and disperse the body of vapour filling them.

Accompanying the report is a map showing by colours lands of three classes that have been examined and considered possible of cultivation, either wholly or in part:—

Grey represents bottom lands, or low-lying lands nearly on a level with the lake surface.

Yellow represents bench lands or lands formed more or less in the nature of flats, at varying heights above the lake.

Brown represents high lands or lands rising directly from the lake or from the bottom lands and bench lands, that do not lie in flats but rise with a more or less uniform slope, not too steep to be cultivated.

Timber leases, or lands reserved, within which blocks of timber may be selected, are outlined in green.

The uncoloured areas around the lake are either slopes too steep and rocky to be cultivated, or are not open to settlement.

Attached hereto is a schedule giving a short synopsis of the sections or quarter sections examined, stating in general terms the character, the altitude above the lake, the soil, the timber, and the quality as agricultural land.

The lands in the schedule refer only to those that may be considered as possibly available for agricultural purposes, either wholly or in part. They seem to be subject to the question of whether there would be sufficient moisture when the timber is cleared off. With the exception of a few flats where the alluvial soil is spread more deeply and where the growth is luxuriant owing to collection of moisture (most frequently grown with large-sized cedar, devil's club and skunk cabbage) they are, generally speaking, very stony. While stony ground is not prohibitive to fruit growing, judging by what has been seen, it is very porous and would soon dry out if exposed without cover to the heat of the sun. The gauge for utility as agricultural lands has

been the possibility of using a plough. The height above the lake for such lands is generally set at 500 feet, but has been carried, where possible, up to 1,200 feet.

It will be found that a large amount of land is here embraced that, to the early settler looking for choice spots, is quite outside the pale. It is difficult to say what land may not be used in the future. In Switzerland, in the Rhone valley, I have seen every foot of space utilized for the growth of grapes and small fruits by building up retaining walls along the mountain side and spreading mould upon the little platforms thus created, many no wider than 10 feet. Whole sides of mountains are thus utilized to produce crops that have a rich marketable value.

With the suitable climatic conditions of Shuswap lake, I should think the industry of small fruits could be successfully carried on in this manner, when it becomes necessary. At Celesta settlement, I saw strawberries planted out on little terraces cut from a steep hillside. At Blind bay settlement, one of the settlers, Mr. J. Barnard, took me into his garden on the 6th of November and cut me several bunches of fine grapes from his vines growing in the open air. They were delicious. Both these and his peaches had taken prizes at the fruit exhibit held at Salmon Arm that summer. In the same garden, tomatoes, marrows and cucumbers were lying about in profusion, as well as all other kinds of vegetables and small fruits. It is not a question of whether things will grow, but where to grow them.

There are, however, two other questions of considerable difficulty, viz.: that of building roads to reach the cultivable bench and high lands, owing to the sharp acclivity directly at the lake, and the difficulty of obtaining water for domestic purposes, when, owing to this acclivity, the lake water is not available or where the settler is not on the lake front. In many places bedrock is so near that digging a well would be impossible and water would have to be piped long distances. It may prove, moreover, that in many parts, when the forest growth is cleared off, owing to the shallowness of the soil, irrigation may become imperative during the hotter part of the summer in order to produce crops.

There are doubtless many problems in connection with the cultivation of land in this district, and I have found none more dubious about its success than those who are most concerned and who are reputed to have been most successful.

NORTH THOMPSON, BOTANIE CREEK, CHASE CREEK AND CHARCOAL CREEK VALLEYS.

Report by Jos. E. Ross, season 1908.

SIR,—I have the honour to submit the following general report on my survey operations in the railway belt, British Columbia, during the season of 1908, which were confined to the westerly or 'dry belt' portion of the Kamloops district, extending from Lytton station on the west to Shuswap station on the east.

I began the season's work on March 9, a few days after I had completed my returns of the previous season, as I had instructions from you stating that as the new plans for several townships to the south of Kamloops could not be issued owing to discrepancies between the old and new surveys it would be necessary for me to investigate the matter as soon as possible and forward the results to the Department.

After finishing this work and making some subdivisions in the same neighbourhood, I made arrangements with the other two parties in the district by which I was to continue the work westerly while they would take up the work in the easterly portion.

But I had only got well started in this direction when I received instructions from you to go back and make corrections of some mistakes in the old surveys in the townships on the north side of Kamloops lake. These mistakes had been found by

myself in 1906 and more fully investigated and confirmed by the late Mr. Stacey in 1907. The corners had to be shifted and new lines run.

On finishing this work and a few additional small surveys in the vicinity, I decided to work westerly so as to lose as little time as possible in moving back and forth.

I might mention here, to show how the general work of the season was interrupted by the resurvey of old surveys, that before the end of the season I was again instructed by you to make further investigations of discrepancies in the neighbourhood of Campbell lake. This was a continuation of my first work of the season.

These resurveys are not without their unpleasant features. To begin with, doing work a second time always has a dispiriting effect. A cause of much vexation is the difficulty in picking up the old line in a hilly country. Usually the new line is just far enough from the old one to give what appears to be a lot of extra work. To avoid this one has to resort to offsetting which involves calculations, simple in themselves, but conducive to mistakes. An annoying obstacle met with in the woods here is the barbed wire fence on the boundaries of grazing leases. It is almost impossible to fell the trees without destroying the fence. It is a relief, therefore, to know that all the discrepancies in the old surveys so far as known have been eliminated.

In proceeding westerly from Kamloops lake I made surveys at nearly all the railway stations from Savonas to Lytton.

On finishing the surveys to the west of Kamloops, I made several small surveys in the North Thompson valley. One of these surveys had been a long standing one on the list as I had not been able to make it before, although I had attempted to do so several times. A resurvey of lot 338 was necessary in order to obtain the areas of adjoining quarter sections, and this is where the difficulty came in. All the corners and boundary marks had been lost as well as the notes of the original survey. It was only through an arrangement between the agent of Dominion lands and the owner that the survey was made possible. The latter agreed to relinquish his claims on the lot and to accept instead the same area as nearly as possible described in sections and fractions thereof in accordance with the Dominion survey system.

On completing the surveys on the North Thompson I resumed the work to the east of Kamloops and continued easterly for the rest of the season, reaching as far as Shuswap.

On account of the similarity of the whole country operated in it will scarcely be necessary to give a description of the different parts surveyed. The general character of the country may be briefly described as follows:—

The main central valley, through which the Canadian Pacific railway runs, lies along Thompson river. The general direction of the river is a little south of west. Above Kamloops, where the North Thompson joins, the river is known as the 'South' Thompson, below Kamloops, the 'Main' Thompson. The width of the valley varies greatly, averaging a little less than a mile. The elevation is about 1,000 feet above sea-level. The land in the valley was, naturally, the first taken up, and is now under cultivation except a few stretches where the soil is alkaline or where water is lacking for irrigation purposes.

The hills rise up on each side to a height of 2,000 feet or more above the valley within a distance of two or three miles, and extend northerly and southerly almost indefinitely, at least as far as the limits of the belt, reaching occasionally an altitude of 5,000 feet. Running north and south there are numerous smaller valleys along the different streams flowing into the Thompson, the North Thompson being the most important. On the tops of the hills, although the surface is much broken with ravines, gulches and rocky ridges, there are considerable areas of nearly level or gently rolling land. Much of this has lain idle for years as it was supposed to be fit only for grazing purposes, but now it is almost entirely taken up and settled on. So far the crops have been better than was expected, even where there was no water for

irrigation. Three thousand feet above sea-level is generally considered to be the limit for general farming. From this altitude upwards the surface is more broken with a thicker growth of timber. At 5,000 feet there is usually a dense growth of jackpine. On the lower hills, the southerly and westerly slopes are either open or sparsely wooded; the northerly and easterly slopes are usually timbered with pine and fir, averaging fifteen inches in diameter. During the heat of summer the Thompson valley presents a very dry, burnt-up appearance, the cultivated fields being the only relief. As a rule good crops are obtained on the irrigated lands. The rougher and higher lands are being gradually brought under cultivation, but the uncultivable lands must always constitute at least three-quarters of the total area.

I will now describe the several surveys to which the foregoing general description does not apply. Botanie creek runs nearly due south and joins Thompson river a few miles above Lytton station, situated at the junction of the Fraser and Thompson. The valley is well watered and densely wooded, forming a striking and most pleasing contrast to the parched hills of the surrounding country. A good wagon road leads from Lytton to the Indian reserve at the upper end of the valley, and it is much frequented on account of it being a cool, pleasant driveway. The good fishing in a small lake in the reserve is another attraction. The portion of the valley I surveyed lies at the north end, the lower part having been already surveyed. It is about a mile and a half in width and walled in by steep mountains on either side. There is some large timber, mostly on the east side of the creek, but the timber generally is small. As the surface is hilly and considerably broken, and the altitude over 3,000 feet above sea-level, I consider this part of the valley is adapted only for dairying and stock raising on a small scale. One settler has located here, but he was absent at the time of the survey.

Chase creek valley is situated to the south of Shuswap station. The distance from Shuswap by the present road which takes a rather circuitous route to the settlement at the upper end of the valley where I began the survey, is rather more than twenty miles. A much better and shorter road could be obtained at a moderate cost by following the valley of the creek. The general direction of Chase creek is almost due north. The stream takes its rise high up in the mountains and in consequence maintains a fairly steady flow throughout the summer, and furnishes water in abundance for irrigating several large farms at its mouth. In general the creek bottom is very narrow, but in sections 7 and 18, township 19, range 12, there is a little good land, but the soil is light. Farther down the creek, in sections 19 and 30, township 19, range 12, and sections 24 and 25, township 19, range 13, there is a larger area of level land, rather lightly wooded. In township 20, range 12, the valley reaches a width of half a mile or more. The land is densely wooded with cedar, spruce and cottonwood. The soil is a black loam with a few inches of vegetable mould covering. The hills are steep and wooded on both sides of the creek. On the east side there is some timber, fir and pine, suitable for milling. There is very little grazing land on the hills.

On Charcoal creek, which runs in a southwesterly direction into Chase creek near the northeast corner of section 19, township 19, range 12, there is a stretch of good bottom land. It begins about two miles up from the mouth of the creek and extends for a distance of three or four miles with a width of half a mile. It is densely covered with alder and willow. The soil is black loam with a good covering of vegetable mould. The hills rise up steeply on both sides; to the south they are covered with thick brush and windfall, and on the north they are timbered with pine and fir, with considerable open ground affording good grazing.

Both Chase and Charcoal creek valleys are subject to summer frosts. Most of the potato crop was killed last season the last week in July. In places not exposed to the early morning sun the injury was only slight. About half a dozen settlers have located in these valleys, but only two were living on their claims at the time of the

survey. Dairying and stock raising are the only branches of farming that can be carried on with success, and these only on a small scale.

I surveyed two mountain meadows, one in the Mamit lake country near the head of Skuhun creek, and the other about twenty-five miles to the northwest of Savonas. These wild hay meadows are usually found in a basin-shaped depression on the tops of the hills at an altitude of 4,000 to 5,000 feet, quite often centered around a small lake forming the source of a mountain stream. To ranchers looking for fodder these meadows are very alluring, but on trial they prove rather disappointing. The disadvantages often more than counterbalance the gains. At such high altitudes the winter is cold and long, and there is very little grazing on the hills as they are usually thickly covered with jackpine. Much time is lost going to and from them. An attendant for the stock is required, and although his time is not fully occupied, there is no other work he can do to advantage. Considering these disadvantages, I think the meadows are scarcely worth taking up.

Of the two hundred and eighty-nine days in the field, three were lost through bad weather, thirty-five were spent in travelling and moving camp, and the balance, excluding Sundays, were occupied in running two hundred and ten miles of line, including retracements, resurveys and traverses. Surveys were made in thirty-four townships.

Game and all kinds of wild animals are gradually getting scarce. The coyotes, alone, although there is a provincial bounty of two dollars per head and the pelts are worth one dollar each, remain undiminished in numbers. These destructive little animals are very much dreaded by farmers keeping sheep and fowl; in fact only a few farmers keep sheep on this account.

According to reports there was considerable loss of timber from bush fires, but we saw none nor any damage that had been done.

The season was an exceptionally good one from a surveyor's point of view, but the summer was too dry to suit farmers or ranchers.

Before closing I would like to refer to a matter which, perhaps, calls for some explanation. Those who have followed the surveying operations in British Columbia will have noticed that the same ground has been practically gone over every few years. This is unavoidable. In making the different surveys on the list I have endeavoured to do all the work necessary in the neighbourhood. At the same time one has to keep in mind the fact that most of the surveys are urgent and therefore as much ground as possible should be covered, otherwise some of the settlers will be subjected to long delays in getting their patents. As it is, some settlers, even in the vicinity of Kamloops, have been kept waiting owing to incomplete surveys, but this was due to unavoidable causes.

GENERAL REPORT DATED FEBRUARY 28, 1910, ON WORK OF SURVEY PARTIES.

A. O. Wheeler, D.L.S., season of 1909.

SIR,—In accordance with your instructions of April 22, 1909, three sub-parties were placed in the field to continue the classification of undisposed lands, within the Railway Belt of British Columbia, commenced in 1908. One was in charge of M. P. Bridgland, D.L.S., another in charge of A. J. Campbell, D.L.S., and the third in charge of R. D. McCaw, D.L.S., chief assistant of my own party. In addition to the work in connection with my own sub-party, the other two were under my personal supervision and were visited from time to time to see how the classification was progressing and to ascertain the nature of the country in which they were working.

General reports of their operations by these gentlemen are attached hereto. Full detailed reports, schedules of descriptions by section, township and range, schedules

of areas, tables of temperatures and lists of squatters, accompanied by maps showing in colours the various classes of land, have already been forwarded to you.

My instructions called for a division of the land examined in five classes, viz.:—

(1) *Fruit land*—Comprising any land with a suitable soil for growing trees, and of low altitude.

(2) *Farm land*—Comprising land which either on account of quality, altitude or other reasons is not suitable for fruit but is adapted for cultivation.

(3) *Grazing land*—Comprising land which is neither fruit nor farming land, with grass growing on it.

(4) *Timber land*—Comprising land which is neither fruit nor farming land, with timber growing upon it.

(5) *Worthless land*—Comprising land which is not fruit or farming land, with neither grass nor timber growing upon it.

It is a somewhat difficult matter to classify lands fit for fruit growing, as, in the present early stages of its culture in the Railway Belt, only the low-lying lands have been experimented with, and climatic conditions are greatly varied. It was found by observation during the past two summers that around the larger inland lakes, such as Shuswap, Adams, Mara, Mabel, Kamloops, etc., the moderate climatic conditions evolved by the heated water surface through late September, October and November prevent, to a very considerable degree, early frosts, and that, on this account, lands surrounding them and in their vicinity are specially adapted to fruit culture and farming. Moreover, the deep beds of these lakes, resembling fjords, act as troughs to conduct moisture laden clouds and, consequently, the rainfall is sufficient without being supplemented by irrigation.

It was also observed that the climatic influences referred to extend to an altitude of about 1,200 feet above the water surface, as indicated by the height at which the warm air rising from the surface condenses and forms an overhanging cloud-belt. The altitude limit, therefore, of farming lands was set at 1,200 feet, and for fruit land at 800 feet above the surface in the vicinity of such water areas. Away from such climatic conditions, it is not thought that fruit can be grown successfully at nearly so great an altitude, and 400 feet above the main valley bottoms, such as those of the Shuswap, North Thompson, South Thompson and Salmon rivers, is probably the limit, although in certain cases, owing to local conditions of climate or soil, it may be grown to advantage at higher altitudes. For general farming, however, vegetables, fodder crops and, in some instances, grain for fodder purposes, can be grown at much higher altitude, reaching even as high as 1,800 or 2,000 feet above the main valley bottom. Apart from the influence of these large lakes and main waterways, particularly on the high lands of the Kamloops plateau, the lands not covered with timber are only suited for grazing, although where it is possible to apply water by means of irrigation they become very prolific through rapid growth and maturity in the summer months.

All the lakes named lie in deep troughs and are enclosed, for the most part, by steep rocky hillsides, clad with timber or showing nearly perpendicular rock faces. The waterways also are in narrow, or comparatively narrow valleys with sides of similar formation and, consequently, the areas suited for cultivation are very limited as compared with the whole area involved.

Not far westerly from Little Shuswap lake open grass lands begin to appear, and from there to the west end of Kamloops lake, on the north side of Thompson river, and to Kamloops on the south side, these areas of grass land become more extensive. Apparently the same class of land continues westerly towards the valleys of Thompson and Bonaparte rivers, but these points named are the farthest to which the surveys of last year were carried.

In the valley of Shuswap river and at the head of Mabel lake some areas of fruit land were located, but along that stream and in the valley of Salmon river, south to the Railway Belt boundary the best lands have been disposed of.

The timber found on the various classes of land is set forth in the schedule of description accompanying the detailed reports. Timber land, as defined above, is necessarily indefinite as to area. It extends all over the high lands of this section of British Columbia, and to travel over such areas for the purpose of examination would take years, owing to the difficulties of such travel and transportation. The results moreover, would give little definite value, except with regard to quality and quantity, as most of the land is beyond the zone suitable for cultivation. All the land seen, other than fruit, farm and grazing lands, was covered by timber that reached to the summit of the high lands. In the grass land belt most of the summits are timbered, and no worthless land, as defined above, was noticed, except in small patches, and then only in the form of rock steeps and precipices, which cannot well be shown on a small scale map, owing to their being nearly vertical.

The detailed reports and schedules of description of individual parcels of land in conjunction with the maps accompanying them, deal fully with the classification of the undisposed lands in the section of the Railway Belt covered by the examination.

As a datum for altitudes, the average elevation of the respective water surfaces of the several lakes above sea-level were used. Where such a datum was not available the elevations are referred to the main waterways traversing the respective areas of lands classified. A list of the datum levels used will be found attached to each map.

Mr. Bridgland first completed the examination of the Columbia river valley from Donald to Beavermouth and down that valley to the Railway Belt limit. There is a narrow area of farming land along the river, chiefly on the west side, and a larger area near the Belt line. For the most part the lower land is flooded and has been classed as grazing land. If suitable drainage could be applied, it is likely a lot of the flooded land could be reclaimed as farm land. There is no access yet by road to this portion of the valley and navigation is prevented during low water by rapids. At high water navigation would be possible, but would be expensive, owing to the swift current.

It is thought that none of this land is suitable for fruit growing as, owing to the early and heavy snowfall, there is an advanced winter and a late spring; the late spring frosts, moreover, combined with the hot sunshine of the middle day have a very injurious effect upon the trees, because when the sap commences to flow during the day and then freezes at night, it causes the bark to peel, ultimately killing the trees. These conditions have been observed at Golden, 28 miles up the valley from Beavermouth.

• Mr. Bridgland also, while here, made an examination up Beaver River valley as far as Mountain creek, but practically with no results. He next examined the Shuswap valley to Mabel lake and north of that lake up the valley of Frog creek. Thence, moving westward he covered the ground lying between the Railway Belt boundary, Shuswap lake and South Thompson river, and the west boundary of range 12, west of the 6th meridian. His maps, detailed report and schedule of descriptions show full particulars.

Mr. Campbell joined his party on June 17. The party commenced work in the valleys of Tonkawatla and Eagle rivers on May 23, Mr. McCaw taking charge of the examination until Mr. Campbell's arrival. Nothing of any account was located until well down Eagle river valley, when some fruit and farm lands were classified. The special climatic conditions surrounding Shuswap lake extend for a considerable distance up this valley and should enable fruit to be grown to advantage. In the upper reaches it is thought the early heavy snowfalls will create conditions prohibitive to successful agriculture. The valley is narrow and the area limited.

On completing the examination of Eagle river, Mr. Campbell transferred his party to Shuswap and examined all the territory bounded on the east by the west boundary of range 12, on the south by the Railway Belt boundary, on the west by the west boundaries of townships 17, 18 and 19, ranges 18, 17 and 16 respectively, and on the north by South Thompson river. Full particulars are shown by his maps, detailed reports and schedules of descriptions.

The third party, in charge of myself and Mr. McCaw, made the examination of the territory north of the Canadian Pacific railway, and within the Railway Belt bound-

ary, as far west as the valley of Deadman river, which joins the South Thompson a short distance below Kamloops lake. Work was commenced at Blind bay on Shuswap lake, where it had been discontinued the season before. It was now carried up the valleys of Scotch creek and Adams lake, and westerly as stated. During the summer this party was divided into two, and one section of it made an examination of lands on Adams lake and Salmon arm of Shuswap lake. This was done in order not to delay the progress westward by the withdrawal of the full party to make the examination in these isolated parts. It had been found earlier in the summer, while the party was working in the vicinity, that the water of Adams lake was too high to enable surveys to be advantageously made to locate the lands classified. Detailed information will be found in the reports and maps already submitted.

On these maps are shown by several colours the respective areas classified. To each map is attached a statement of the datum levels from which the altitudes given in the schedules of description are computed; and also of the areas of the various classes shown by colours on the said maps.

Generally it may be said that the fruit and farm lands are found in and along the sides of the valleys, and that the highlands are, for the most part, grazing and timber areas. This will account for the relatively small area of land suitable for cultivation as compared with the total area that has been examined.

The following is a summary of land classified by all the parties:—

	Acres.
Total area classed as fruit land..	60,748
Probable area fit for cultivation..	43,248
Total area classed as farming land..	97,391
Probable area fit for cultivation..	59,509
Total area classed as grazing land..	243,124

By far the largest portion of the remainder of the area involved is land covered by timber, and what then remains is water surface and worthless land, the latter rock exposures and land at too great an altitude to be accessible.

COLUMBIA RIVER VALLEY

(North and South of Golden and South of Shuswap Lake).

Report by M. P. Bridgland, D.L.S., season 1909.

Townships included in the following report:—Range 24, township 20; range 25, township 29, 30, 31, 32; range 26, township 31, 32; range 27, township 32; all West 5th Mer.; range 5, township 19, 20, 21, 22; range 6, township 19; range 7, township 18, 19; range 8, township 18, 19, 20, 21; range 9, township 17, 18, 19, 20; range 10, township 17, 18, 19, 20, 21; range 11, township 17, 18, 19, 20, 21, 22; range 12, township 17, 18, 19, 20, 21, 22, all West 6th Mer.

SIR,—I beg to submit the following report concerning the lands examined in the Columbia Valley, between Donald and the north limit of the Railway Belt.

Between Donald and Beavermouth, in township 29, range 24, the Columbia valley consists of a narrow, rocky canyon with steep slopes and high benches on both sides. That part of this township which lies north of the river is included in the Donald Forest Reserve, and was therefore not examined. On the south side, the slopes and benches are broken and rocky, and it is improbable that they can be of any use for agriculture. Near the railroad they are covered chiefly by old brulé, overgrown with willow, jack pine, small fir and hemlock, and with much windfall; when green timber was found it was not of sufficient size or quantity to be of commercial value, though it is probable that there is good timber farther back on the main slopes of the mountains. All the land is included in timber berths 19, 295 and 27.

From Beavermouth to near the mouth of Gold creek, the valley is a low level flat about three-quarters of a mile wide, with steep, rocky slopes on either side. Till near the north boundary of section 18, township 31, range 25, this flat consists chiefly of spruce and cedar swamp, lying almost entirely on the west side of the river, and rather badly broken in township 31 by side channels of the river. There are two large meadows, one lying in the west half of section 29 and the other in sections 31 and 32, township 30, range 25, partially open, with scattered willow brush, north of section 18, instead of spruce flats there are large swamp meadows lying on both sides of the river, with a narrow belt of timber along the banks.

About a mile south of the mouth of Gold creek the valley becomes wider on the west side, and there are here large swampy meadows broken by strips of spruce, cottonwood and cedar, with much willow in places, and some sloughs. These flats are between six and seven square miles in extent.

On the east side, about a mile north of the mouth of Bush river, the valley widens to the east and there are large swamps very similar to those at the mouth of Gold creek, comprising in all about three square miles. Adjoining these swamps and lying between them and the north limit of the Railway Belt, there is a tract of about four square miles of rolling land, timbered with hemlock, fir, spruce and cedar, rising in places to 200 feet above the valley. Much of this land would be excellent for farming.

The valley of Bush river varies from one-half to three-quarters of a mile in width, and is very similar to that of the Columbia, consisting of swampy meadows with strips of timber and scattered willow brush, broken in places by small sloughs and beaver ponds. About twelve miles from the mouth, the river breaks up into a large number of channels, and the bottom consists largely of gravel bars covered with a growth of scattered scrub spruce and jack pine. On the north side, between Bush river and Succour creek, in sections 22 and 23, township 32, range 26, there are three of four quarter sections of good bench land rising to about 200 feet above the valley. There is also a narrow strip of land along the bottom of Succour creek, but not enough to be of much importance.

On the east side of the Columbia, between it and Succour creek, there is a timbered ridge 500 feet and upwards above the valley. Still farther east there are more benches about the same elevation lying between Succour creek and the main slopes of the mountains. These benches are partially timbered with cedar, fir, pine and hemlock, some of which is of good value. Nearly all good timber is included in timber berth 85. There are also in these benches, large areas of old *brulé* overgrown with underbrush of nearly every description. Wherever the slopes have been burned off the land appears very stony and rocky, and in some places seems to be almost solid rock. Most of these benches seem too rough for farming, and in many places, especially on the ridges between the Columbia and Succour creek, it would be difficult to obtain water.

On the west side of the river the slopes of the mountains rise in most cases abruptly from the edge of the bottom lands. Some small benches were examined and found to be high, rough and stony, and not suitable for cultivation. Near Gold creek these slopes are covered with old *brulé* overgrown with thick hemlock, fir and cedar, but the remainder of the slopes between here and Beavermouth are heavily timbered. All this timber is included in timber berths 70 and 343. In the Gold Creek flats the timber consists largely of a strip of spruce and cedar five to ten chains wide along the river bank, and irregular strips of spruce and cottonwood through the swamps. There is some good timber here but it is doubtful if there is enough to make it valuable, and as yet it has not been included in any timber limit.

On the east side, between Bush river and the north limit of the railway belt, there is some good timber on the rolling land previously mentioned, and also along Bush river and some of the adjacent slopes. This is included in timber berth 85.

In high water nearly all the swamps are liable to flooding and, when examined, were covered with water generally from one to two feet deep. Nearly all the timbered flats were also very wet and swampy. It is probable that much of the swamp land and nearly all the timbered land could be drained and while the lower portions

might not make good general farm land, they would be excellent for hay. In most cases a great deal of the flooding is due to the melting snow on the mountains, but in some places the land is flooded directly from the river. This might possibly be prevented by building dykes where needed.

All land suitable for cultivation in this section has been classified either as farm land or grazing land. The general opinion of all who had been here was that it was not suitable for fruit growing. The winter is very severe and the spring is late. The examination of lands was commenced at the mouth of Bush river on May 24, and there was then much snow in the timber on the bottom lands. Until the middle of June, snow was plentiful on the benches within 500 feet of the river.

The valley of the Beaver river was examined as far south as the north limit of the Mountain Park Forest reserve. The valley is very narrow and is for the greater part of the distance little more than a rock canyon. The timber adjacent to the railroad has been burned off, but there is good timber farther back on the mountains. Between the Beaver river and Quartz creek there is a high bench with much hemlock, fir and cedar, but owing to its elevation this is not suitable for cultivation. All good timber along the river is included in timber berths 30, 116, 343, 40 and 446.

Up to the present time there are no settlers in this part of the Columbia valley, and it is not likely that there will be any until there is some easy means of access. At present the only ways are by boat down the Columbia river from Beavermouth or by pack trail from Donald to Bush river, a distance of thirty miles. For eight miles below Beavermouth the river is very swift and it is almost impossible to bring a boat against the current during high water. From here to the head of Surprise rapids, the river runs about three miles per hour and is from fifteen to twenty chains wide. The trail from Donald runs by the Blackwater lakes about 800 feet above the Columbia, and is impassable for horses during a large part of the year owing to the heavy snowfalls on the summit. Apparently the easiest way to open up the valley would be to build a bridge across the Beaver river and put a wagon road down the west side of the Columbia. A bridge was formerly built by one of the lumber companies and a road made to a camp about four miles down the river, but the bridge has been washed away. From this road easy access to the opposite side of the valley could be obtained by means of a ferry near the mouth of Bush river. The current here is not very swift and the Columbia river from fifteen to twenty chains wide.

With the exception of the Gold Creek flats nearly all the land suitable for settlement is held in timber limits 70 and 85. In these limits there are large areas of swamp lands with little or no timber of commercial value. If there should be any possibility of this land being thrown open for settlement it might be of advantage to have further surveys made in the vicinity, notwithstanding the existing difficulty of reaching it. At the present time the only survey is the one made by Jos. E. Ross, D.L.S., in 1907. Mr. Ross made a traverse of the river to the north limit of the Railway belt and planted witness posts along the banks, on all east and west section lines.

I would also beg to submit the following information regarding the land examined in the Railway Belt in ranges 5 to 12 inclusive, west of the 6th meridian, lying south of the Canadian Pacific railway. This does not include the valley of the Eagle river, which was examined by Messrs. McCaw and Campbell, D.L.S.

The lands suitable for cultivation throughout this district are widely scattered and no very large areas were found in any one place. Nearly all the low land, except a little held under timber leases, has been taken up and now the settlers are going farther back and taking land which a few years ago was considered worthless.

Starting on the east side, the first land found lies in secs. 20 and 21, range 5, along the valley of Frog creek. There is here an area of about 3,300 acres lying within 500 feet above Mabel lake, or within about 650 feet above Shuswap lake. Near the mouth of Frog creek the land is very swampy but as there is a large fall to the creek; it could probably be easily drained. Farther north the land consists of nearly level benches, all of which could be irrigated by water from Frog creek or its tributaries,

if irrigation should be required. The worst trouble is that many of them are very stony, and some parts would be worthless for that reason. There is some old *brulé*, but nearly all the land is well timbered with hemlock, cedar, scattered fir and white pine. It is all included in timber berths 237 and 349.

The only means of opening up this area would be by means of a road from Three Valley lake to Mabel lake. There are no canyons, and all swamps and heavy grades could be avoided unless near Three Valley lake. The only other way is from Enderby by wagon road for 24 miles, and then 10 or 12 miles by boat to the mouth of the Frog creek.

In the immediate vicinity of Mabel lake there is very little land available for settlement within the Railway Belt. The shores are nearly all steep and rocky, rising in most places to 1,000 feet or more above the lake. Near the lake there does not appear to be much timber of commercial value, but there is scattered fir, hemlock and cedar, with much underbrush. The land up Noisy creek was examined for a distance of 3 miles, and was found to be rough and rolling, only small pockets being suitable for cultivation. There is some good timber, chiefly hemlock, cedar and fir, lying for the most part along the valleys of the creek or its tributaries. Noisy creek and the upper part of Mabel lake is included in timber berth 237.

A considerable area of good land was found along the upper part of the Shuswap valley, between Enderby and Mabel lake, lying in township 19, ranges 6 and 7, and in township 18, ranges 7 and 8. Most of this land lies on the south side of the river and consists of rolling benches rising from the river to 800 feet above, but there are some good flats near the level of the river. This has all formerly been included in timber berth 238, and most of it is still held in the berth. There is still much good timber on a great deal of the land. On the north side, part of which is also included in the timber berth, there is practically no timber on the lands suitable for settlement, and the timber on many of the slopes is of doubtful or very low value. Several quarter sections on the north side are held by squatters, with the consent of the lumber company.

The soil on the south side of the river appears to be a very fine clay loam without a great deal of stone where level. Much of this land could be irrigated without difficulty, but it is doubtful if irrigation would be necessary. On the north side the soil on the benches is more sandy and stony and appears very dry. Except on the flats, irrigation would be a difficult and expensive undertaking.

On the east side of the valley, between Enderby and the south limit of the Railway Belt, the lands taken, in every case, run back on the steep mountain slopes. In township 18, range 8, these slopes are well timbered, but farther south they become very rocky, with willow brush and old *brulé*. In township 17, range 9, the slopes become more open and grassy with scattered fir and bull pine. All the lower slopes here are held under grazing leases.

From Enderby to Sicamous, along the east side of the Shuswap river and Mara lake there is very little land not disposed of, fit for cultivation. What land remains lies in township 20, and near the north boundary of township 19, range 8. The timber is very poor and some of it has recently been burned over. The soil is very dry and inclined to be sandy, with much stone in places. There are several streams coming down from the mountains and nearly all the available land could be irrigated.

On the west side, in townships 18 and 19, range 9, above Enderby, there is a rolling ridge rising to about 1,500 feet above the town. This ridge is very much broken by rock outcrops, and very little of the land not already disposed of is of any use for agriculture. There is some scattered large fir with underbrush in places, but it is partially open and would be of some value for grazing. Farther north on the east side of township 20, range 8, and near the boundary between townships 19 and 20, range 9, there is some high rolling land 1,000 to 1,200 feet above Shuswap lake. Much of this is old *brulé*, but there is considerable timber in the northern part, some of which is included in timber berth 386. The soil appears to be red sandy clay loam,

and would probably be suitable for farming if not too dry. Water is very scarce, and there is no apparent means of irrigation.

On the west side of township 20, range 9, the lands disposed of run back on the sides of the hills to an elevation of 700 or 800 feet above the lake. The hillsides are all covered with old *brulé* overgrown with very thick underbrush, and are too rough for cultivation. Much of the soil is very stony, with rock outcrops. Similar conditions prevail on the west side of Canoe and Deep Creek valleys, and on the south side of township 20, range 10.

In townships 18 and 19, range 10, all land not disposed of on the east side of the Salmon river, lies on the slopes of mount Ida or on the ridge running south from the mountain. There is no land here of any account which is suitable for cultivation. The land is open with much scattered fir and bull pine, part of which is included in timber berth 441, blocks 1 and 2, and timber berth 480. There is much pine grass with a good deal of bunch grass, so that there is good grazing on a considerable portion of it.

On the opposite side of Salmon river in township 19, the slopes are steep, rocky and brushy and of no value for cultivation, or for grazing in their present condition. In township 18, range 10, and extending farther west into the next range, there are several sections of good land, ranging from 300 to 1,300 feet above Shuswap lake. There is some timber on this land, but it is mostly small, and there is much underbrush on the western part. If irrigation is required, there are two or three large streams from the mountains which could be used for the purpose. The soil throughout is a light clay loam with some gravel, and becomes stony on the slopes near the mountains. There are at present time settlers on six quarter sections here who have not yet received entries.

In township 17, range 10, there is a rough rolling ridge, 500 to 1,700 feet above Armstrong, some of which might be suitable for cultivation, if not too dry. The land which is suitable for cultivation lies to the south, 900 to 1,300 feet above Armstrong. Farther north, the land is rocky, well timbered and fairly open affording a certain amount of pasture, while the slopes facing the north are very steep and covered with thick underbrush. The soil is a light clay with much stone and gravel. The hill is very dry and there is no running water on the south side and only one very small stream on the north.

Along the valleys of Salmon river and Boleyn creek in township 17, range 11 and townships 17 and 18, range 12, there is very little vacant land fit for settlement. The valleys are narrow, with steep slopes on both sides. Nearly all slopes facing north are covered with thick underbrush and of no value for grazing. The slopes on the north side, facing south or west, are mostly open with scattered fir and bull pine, which would be of some commercial value. Some of this is included in timber berth 441, block 3. There is much pine grass in places and the slopes make good grazing land. In secs. 31 and 32, township 18 and in secs. 6 and 7, township 19, range 12, there are some benches which might be suitable for farming, but these are very dry and without any water for irrigation. The soil is a white, sandy clay, with a good deal of shale and gravel, and it is probable that irrigation would be necessary.

In the valley of Chase creek, in townships 18, 20 and 21, range 12, the land suitable for cultivation consists of a narrow strip along the bottom of the valley. The slopes on both sides of the creek are very brushy with some good timber. The land on the west side in township 21 is probably of some value for grazing, and also for timber. It is partially open, timber, fir and bull pine, but there is very little bunch grass. The soil in the valley is a light clay, becoming more sandy and stony on the hillsides. As there is a big fall in Chase creek, all of the bottom land and some of the lower slopes could be irrigated if the water rights are not already taken.

Charcoal creek has also a very narrow valley with good grazing land on the north side of the lower portion. There is also some fair timber here. On the south side of the valley the slopes are covered with thick underbrush without any timber. There

are three settlers near the boundary between townships 19 and 20, who have most of the good land. The upper part of the valley widens out into a rolling jackpine flat, rising toward the east 2,200 feet and upwards above Shuswap lake. It is doubtful if land as high up as this can be farmed successfully.

In the valley of Tappen creek (Granite creek) and farther west toward Shuswap station, there is some good land in the bottom of the valley, 600 to 700 feet above Shuswap lake, much of which would be suitable for fruit. The greater portion of this land lies in township 21, range 11, and is included in timber berth 242. There is also some good land in the northeast part of township 21, range 12, of which the three best quarter sections are included in timber berth 437. There is considerable merchantable timber in these two timber berths and also in timber berth 451. Much of the land in the bottom could be irrigated if necessary. There are also some higher benches, but these are very dry and without any available water for irrigation, which would probably be necessary. Much of the land on the north side of the valley in both townships is held under grazing leases. It is partially open, with underbrush in places, and scattered fir and bull pine, while many of the slopes and ridges are very rocky. There is much pine grass throughout, with scattered bunch grass, and it is of some value as grazing or timber land. All land on the south side of this valley is covered with heavy underbrush, and there is very little timber of commercial value. Most of the slopes are steep, rough and rocky and not suitable for cultivation, while the underbrush is too dense for grazing.

Mr. P. M. Hume made an examination of the lands lying south of the railway, in township 22, ranges 11 and 12. The land already taken runs back on the hills, and there is very little land remaining that can be of any use for agriculture. Most of the slopes are very steep and rocky and covered with heavy underbrush and scattered large trees.

The soil throughout appears to be a mixture of very fine clay and loam, being more sandy and red in colour where the land has been badly burned. This is especially noticeable on many of the slopes north and east of the Shuswap river. In townships 19 and 20, range 9, the soil is very light and of reddish colour, but not very sandy. In other places where the land has not been burned over, the soil appears similar, but varies in colour from white to yellow.

It is very hard to form any definite idea of what land is or is not suitable for cultivation without irrigation. While the fine white soil on the benches appears very dry, the settlers claim that it holds the water, and the part below the surface remains moist. It never becomes hard or cracks as does some of the clay in the lower flats. Probably most of the land facing north, such as the south side of the Shuswap river and perhaps Frog Creek valley, might be all right without water. West of the Shuswap river, in range 9, the soil is drier and without water, but those taking up the land believe that there is sufficient moisture. In the Salmon River valley, and westward, it is probable that all benches will require water. In township 18, range 10, this can be obtained for the benches on the west side of the river, if the water rights are not all taken, but farther west it is doubtful in many places if water can be secured.

Fruit growing is still in an experimental stage, but those interested appear confident that all the hardier fruits will do well. On Mr. Inch's place, near Enderby, 250 feet above the valley, apple and plum trees are in good condition and bearing fruit. Mr. Inch has also some grape vines, and claims that he has no difficulty in ripening the fruit. Small fruit such as currants and gooseberries will do well all through the valley. In Deep Creek valley, fruit trees in the bottom lands do not appear to be in good condition, but in the southeast corner of township 19, range 9, about 100 feet above Deep creek, or 600 feet above the Shuswap valley, there are some young trees which are doing well. On the south side of township 18, range 10, on a small bench about 800 feet above the Shuswap river, there are some young trees which appear to be in excellent condition.

The opinion of settlers throughout varies as to the elevation at which fruit can be successfully grown. The more conservative place the elevation at from 500 to

800 feet above the Shuswap valley, while some of the more optimistic think that it can be grown still higher. Consequently, all suitable land within 800 feet of the valley has been classed as fruit land. Lands suitable for cultivation above this elevation and some low lands which are near the level of the river and rather wet, have been classed as farm lands.

The bulk of the lands suitable for settlement which have not yet been surveyed, lies in the north part of township 20, and in township 21, range 5, along the valley of Frog creek, and in township 19, range 6, and township 18, ranges 7 and 8, along the south side of the Shuswap river. Nearly all this land is at the present time included in timber berths, and is fairly well timbered. If there should be any prospect of these lands being surrendered by the lumber companies, it might be well to extend the surveys in this direction. In township 21, ranges 11 and 12, there is also some unsurveyed land suitable for settlement, most of which is included in timber berths. There is some fair land on the south part of township 20, range 9, but the surveys here are still somewhat in advance of the settlements.

Accompanying this report is a schedule giving a description by section, township and range, of all land examined. A table of areas of the several classes of land, and a table of temperatures taken throughout the survey is submitted herewith, and also a list of the names of the squatters in so far as they could be obtained.

EAGLE PASS AND EAGLE RIVER; SOUTH OF EAGLE RIVER; SALMON RIVER VALLEY; MONTE CREEK.

Report by A. J. Campbell, D.L.S., season 1909.

Townships included in the following report:—Range 2, township 23; range 3, township 23; range 4, township 22, 23; range 5, township 23; range 6, township 22, 23; range 7, township 21, 22; range 8, township 22; range 13, township 17, 18, 19, 20, 21; range 14, township 16, 17, 18, 19, 20; range 15, township 18, 19, all West 6th Mer.

SIR,—I have the honour to submit the following report concerning the lands examined in the Eagle pass and Eagle River valleys between Revelstoke and Sicomous; and the lands lying between the South Thompson river and the southerly limit of the Railway Belt, west of range 12.

EAGLE PASS AND RIVER.

The Eagle Pass valley from Revelstoke to Three Valley is very narrow, having steep, rocky slopes on each side rising directly from railroad. In east part of township 23, range 3, there is a fair amount of land on benches and workable slopes. In a few places along the valley are patches of low land which are swampy and liable to be flooded, and these would make good agricultural land could they be drained. In the vicinity of Three Valley lake and the South Pass valley tributary to it, from the south, is a good area of bench land and lands on gentle slopes. Along the bottom of the South Pass valley is a strip of land adapted for agriculture, but much of it is flooded from mountain streams from east. The course of many of these could possibly be diverted and much flooding prevented. Below Griffin lake and between that lake and Craigellachie, the valley of Eagle river is narrow with steep slopes on either side. In a few places areas of land on gentle slopes and small benches are found. The bottom land is generally low and swampy and liable to be flooded, in some places, being under water a good part of summer, and as they are near level of river would be difficult to drain. The north fork of Eagle river has a very narrow valley with steep, rocky slopes, having no land suitable for agriculture. Below Craigellachie, and from there to Bowie, the valley widens out considerably, giving a fair amount of bottom land and low bench land, while the slopes in places are more gentle, particularly

to the north side of the valley in the vicinity of Craigellachie creek. Near Malakwa the valley is wide and considerable area is under cultivation. Yard creek, until it reaches the low land near Eagle river, has a deep valley with steep slopes. At Bowie the valley becomes narrow again and remains narrow for 3 miles. To the north are high rock cliffs and to the south are steep, rough slopes. The bottom of the valley varies in width up to half a mile. In this bottom land there are a number of sloughs which hold the flood water in basins. In the last few miles above Sicamous the valley widens out, having considerable area of bottom land, particularly to south of the river, and a fair amount of bench land on gentle slopes.

The swamp lands along the Eagle Pass river, for most part, would be difficult to drain, as they are very near the same level as the river, and every spring are flooded anew. If drained, they would make excellent agricultural land. There is also a large amount of bottom land which is flooded during high water, thus making it unfit for fruit growing which, otherwise, it is especially adapted for. Irrigation is not required in these valleys, there being an abundance of rainfall and heavy dews during the summer months.

Fruit growing has not been tried very extensively in the Eagle valley, but there is no doubt that it would be a success. It is hard to say to what limit of altitude above the valley fruit could be successfully grown, as there has been no attempt at cultivation other than on the lower benches and bottom lands. In the vicinity of Revelstoke, in the part examined, there is a fine young orchard, and near Craigellachie and Malakwa there are a number of promising young orchards. In one of these latter are a few apple trees nearly fifteen years old which are bearing good fruit. Small fruits of all kinds do excellently well. Vegetables of all kinds and grains can be raised, the vegetables doing extremely well. Grain has not been tried extensively, the settlers going more into the raising of vegetables and fruits.

The soil in Eagle valley is generally sandy, with some clay and sandy loam. Gravel is found on the higher ground. On the bottom lands which are flooded is a deposit of silt from the overflow of the river.

The greater part of the available land along the Eagle valley is included in timber berths. There is a large amount of valuable timber left on these berths, but in a number of places the greater part has either been cut or burnt off. The principal varieties of timber are cedar, fir and hemlock. In the bottom of the valley the growth is dense, large cedar up to 4 feet in diameter, poplar, balm of Gilead, devil's club and brush.

BETWEEN SOUTH THOMPSON RIVER AND SOUTH LIMIT OF RAILWAY BELT.

The southerly side of the valley of the South Thompson river, in the vicinity of Shuswap and Kamloops, may be generally described as a series of benches rising in steps from the river, following the valleys of many small creeks. The land adjacent to the river and running back on gentle slopes may be called bottom land.

In range 13 the mountain slopes, except for two cases which will be mentioned later, rise directly from the bottom land, having no bench land of any account. The exceptions are the basin of Harper lake in the north part of township 20, and the valley of Martin creek in northwest part of township 19 and southwest part of township 20. To the north of the Martin Mountain Forest Reserve the slopes rise rapidly from the bottom land to a height of from 500 to 600 feet above the river, and then rise gently to the Forest Reserve, the highest elevation on boundary of the reserve being 2,700 feet above the river.

The bottom lands and bench lands near the river require irrigation. The lands lying in the Harper Lake basin and those to north of the Martin Mountain Reserve, do not seem to require irrigation to the same extent, particularly those which lie on slopes falling to north. It has been found, throughout the whole district examined, that the slopes falling to north or on bench lands flanked to the south by mountains do not require irrigation to the same extent as slopes falling to south. The bottom

lands around Shuswap, which are all disposed of, are irrigated with water from Chase creek. Below the Neskainlith Indian Reserve the bottom lands along the river are all disposed of, but only a very small percentage is under cultivation, viz., the parts which can be easily irrigated, and for that purpose practically all the available water is used. The most of the small creeks which run into the South Thompson river have plenty of water back in the hills, but are dry when they get near the river.

The soil is generally a light clay loam with some sand. On the bottom lands the soil is a light clay with a large percentage of sand. The steep slopes rising from the bottom lands are composed of a very fine light clay. The soil on the higher benches and slopes is a clay loam with a small percentage of sand.

Adjoining the South Thompson river the bush is very thin, being open on the bottom lands except adjacent to the streams, where there are a few bull pine, fir and jack pine. The lower slopes and benches are thinly covered with bull pine and fir, while back on the higher slopes the bull pine disappears and the bush becomes thicker and composed of smaller trees: fir, jack, pine, poplar, spruce and brush.

The grazing in this part is good, the bunch grass grows in the open places, while in the bush the timber or pine grass appears. This timber grass is only fit for grazing purposes in the spring when it is young and green, for when it cures, the nutriment seems to dry out of it.

In the valleys of Bolem and Paxton creek in townships 18 and 19, range 13, there is considerable land that could be cultivated, particularly in the portion of township 18 to the south of the creek. The elevation is high, the creek being from 1,400 to 2,000 feet above the South Thompson river, and, owing to summer frosts, it is doubtful whether the land would be of much use for agricultural purposes. The only land under cultivation at present is that along the bottom of the valley, which can be easily irrigated. The land is very dry and requires irrigation, which would be difficult as there is little water to use for that purpose. The timber is generally small, particularly to the south of the creek in township 18, and consists, for the most part, of small jack pine, poplar and brush, with fir of fair size scattered and in clumps. In the portion of township 18 to the north of Paxton creek there is a considerable amount of bull pine and fir of value for timber purposes. Timber grass grows throughout, affording a fair class of grazing.

The Salmon River valley in township 17, ranges 13 and 14, is a wide trough flanked on each side by steep slopes, becoming narrower in south part of township 17, range 14 and very narrow in township 16, range 14. The greater part of the land which is suitable for cultivation has been disposed of; a few very small pieces are found near foot of slopes and a narrow strip along the bottom of valley in township 16. In township 17, range 14, there is a considerable area of bench land and land on gentle slopes rising to Monté hills that could be cultivated, but it would be necessary to irrigate it, and there is no water. Irrigation is necessary throughout the valley, water from Salmon river, Ingram creek and Monté lake being used for that purpose. The water of Salmon river is all taken for irrigation, the river being dry in places along the bed from that cause. The soil is generally a sandy clay, with some gravel in places. Along the north of the valley, in township 17, range 13, the slopes are very steep and rocky. The bush to the south and east of Salmon river is generally small fir and jack pine, with a few larger fir and bull pine scattered throughout. To the west of Ingram creek there is a good growth of fir suitable for tie timber. The north side of the valley in township 17, range 13, has little bush, there being a very few fir and bull pine of a scrubby nature in places. The slopes rising to the Monté Hills Forest Reserve in township 17, range 14, are covered with a good growth of bull pine and fir. The grazing is of a poor quality, the grass of a scant growth and generally timber grass; some bunch grass appears in the open spaces.

The valley of Monté creek is narrow through township 18, range 14, having steep high slopes on either side. The slopes to the west side of Monté lake rise directly from the shore of the lake and are very steep and rocky, while those to the east are

rough and broken, having small patches which would be of some use if water could be applied. Along the valley of the small creek, flowing into Monté lake from the east, there is some bench land and land on gentle slopes suitable for cultivation, which could in part be irrigated with water from this creek. The valley of Monté creek, through township 19, ranges 14 and 15, becomes wider and develops, to the north part, into a narrow ravine to 200 feet deep, with bench land extending to considerable distance on either side. This bench land extends to the west across the north part of township 19, range 15, and into range 16 to Campbell creek. The greater part of this land is suitable for cultivation, but would require irrigation, and water is scarce, all water rights having been secured from Monté, Robbins, Buce and Campbell creeks. In ranges 14, 15 and 16, the bottom land along the South Thompson river is all disposed of. The soil is similar to the other parts, being light sandy clay and clay loam with some gravel in places. The slopes rising from the bottom land are made up of a very fine white clay and are broken by many ravines and gullies. The bush in these ranges is similar to that in range 13. Along the river the greater part is open, having a few patches of bush. The bench land is thinly covered with fir and bull pine of good size and of value for timber purposes. Grass is of scant growth and is generally timber grass, with bunch grass appearing in open places.

To the south of the bench land of north part of township 18, range 15, steep rocky slopes rise to another series of benches. This bench land covers the south part of township 19 and a good part of township 18, ranges 15 and 16, including the country around Campbell and Scuittoe lakes. It is at high elevation, ranging from 1,700 feet to 3,000 feet above the South Thompson river. There seems to be more moisture than on the lower benches, and irrigation is not so vitally necessary. The settlers are able to raise crops without the aid of irrigation. Besides the increase in moisture, the soil is heavier, than on the lower benches and will keep damp for a longer period. The soil is a rich clay loam with considerable black loam. Gravel appears generally, and rock outcrops in a few places. To the northeast of Buce creek and to northeast and southeast of Campbell lake, the country is open. The remaining parts are covered with a good growth of fir timber and some bull pine. In the south part of township 18, ranges 15 and 16, the timber is smaller, consisting of small jack pine, some fir, poplar and brush. In the open places the bunch grass affords good grazing, while in the bush the timber grass supplies a certain amount of it. The latter is no more than sufficient for the cattle that range there, the grass in the open places being eaten so close to the ground as to almost give an appearance of barrenness.

SHUSWAP LAKE AND ADAMS LAKE.

Report by A. O. Wheeler, D.L.S., season 1909.

Townships included in the following report:—Range 9, township 21; range 10, township 22; range 11, township 22, 23, 24, 25; range 12, township 22, 23, 25; range 13, township 23, 24, 25; range 14, township 24, 25, all West 6th Mer.

SIR,—I have the honour to submit the following report containing general information concerning the classification of lands examined on Shuswap lake and Adams lake during the season of 1909.

SHUSWAP LAKE.

Work was first taken up at Blind bay, where it had been closed the previous season. A small strip of land along the east shore of that bay and the adjacent point, opposite Copper island, were examined. They chiefly represent steep hillsides with a small flat on the point. On both there is a scattering of Douglas fir of value for lumbering purposes. The strip of land, but not the point, is situated in timber berth 455 (3). That they are considered suitable for cultivation is exemplified by the fact that two squatters have made homes for themselves there and are cultivating land, viz.: John Immel on SW. $\frac{1}{4}$, section 20, and one Reedman on SE. $\frac{1}{4}$, section 30, both in township 22, range 10.

All the undisposed of lands west of Blind bay, on the south side of the lake, had been classified during the season of 1908, so the party proceeded to the north shore, opposite Copper island, and examined some bench lands in townships 22 and 23, range 11, rising to an elevation of 900 feet above the lake. They are rough and broken and heavily timbered. The only available water frontage has, since examination, been squatted upon by John Thompson on the NE. $\frac{1}{4}$ of section 35, township 22, range 11.

An examination was next made of the undisposed of lands north of the extreme westerly end of the lake and along the east side of Adams river. The examination embraced all lands within an altitude of 1,200 feet above the lake, this being considered the extreme altitude at which cultivation, in this section, could be successfully carried on. Most of the lands examined are in timber berth 263. The surface consists of general easy slopes to the lake, and is rough, broken and stony, but the area contains land that may some day be called on for the purposes of cultivation. Oliver Freeman has squatted on the NE. $\frac{1}{4}$ of section 25, township 22, range 12, and has a nice little piece of land under cultivation, where he grows excellent vegetables and has some fruit trees set out. The soil where he grows these is almost entirely a shaley gravel and the result shows what can be done with this class of soil if water can be applied to it. He irrigates from the creek flowing through the $\frac{1}{4}$ section.

SCOTCH CREEK.

An expedition was now made up Scotch creek by an old Indian trail to the principal fork of that stream. Little land of agricultural usefulness was found. On the east side the hill slopes descend steeply to the bed of the creek and afford no opportunities for agriculture. On the west side, along the trail, are a few small areas of bench land at from 150 to 800 feet above Shuswap lake. They have been classed as farm lands, as, owing to the dry, stony soil, they were not considered suitable for fruit growing. Most of these small benches can be irrigated from one or other of the many streams flowing in their vicinity, and might then be found suitable for fruit growing. At present there is no access to this valley except by pack trail. The bench lands have been located only approximately, as I did not consider the small area involved of sufficient importance to warrant the expense of definite surveys, which would have taken up a lot of time.

NORTH SHORE OF SALMON ARM.

In township 21, range 9, parts of sections 7, 8, 17, 18, 19, 20 and 21, lying along a good strong creek from the hills were examined. They consist of pretty steep slopes to the creek and a general fall to the lake. The ground is rough and broken for the most part. There are some easy slopes that would give good agricultural results, but the land is not very accessible, and the construction of a road would be a work of some difficulty. A portion of the area is in timber berth 239 (6). For the most of the waterfront there is a steep drop of 100 to 200 feet to the lake shore. The soil is sandy loam and very stony. A lot of good timber is found scattering throughout, fir to 24 inches, bull pine to 20 inches, white pine to 18 inches, spruce and cedar to 15 inches diameter, of lumber value. The area to 800 feet above the lake has been classified as fruit land, and beyond that to 1,200 feet as farm land.

ADAMS LAKE.

In the middle of June a party was taken up Adams lake to ascertain what lands were available for agricultural purposes. Some land was found on both sides near the Railway Belt line. Owing to the few surveys that have yet been done at the upper end of the lake, it was necessary that a considerable amount of traverse should be made to locate the lands examined; also a quick triangulation was required to obtain starting points. At the exit of the Adams river from the lake, the Adams River Lumber Company have a dam which is used to heighten the water in the lake. This was now closed and the water was so high that traverse was impossible without con-

tinually cutting lines through the bush, a work for which the party was not of sufficient strength. So the examination was postponed until later in the season. At this time, also, the lands along Pass creek, flowing into Agate bay were looked over and it was found that they were worth a careful examination. About the middle of September I made up a special party, so as not to interfere with the work of the other parties and returned to make the classification required. The salmon (steel-heads) were then running into the lake and the lumber company were, under the law, obliged to leave the dam open, so the water was lower and the necessary surveys and examination were successfully completed.

There is here a very small area of land for cultivation, within the Railway Belt, as compared with the area lying along the lake. For the most part, steep rocky slopes descend so sheer as to render cultivation out of the question. The bulk of what there is lies directly adjoining the Railway Belt line on both sides (see map submitted with D. L. S. McCaw's report). Here, easy slopes extend back from the lake in a series of steps. Along these to an elevation of 800 feet above the lake has been classed as fruit lands, and beyond that to an elevation of 1,200 feet as farm lands. These slopes have been thickly timbered, but of recent years those adjacent to the lake have been badly scorched by fire. Notwithstanding, there is still a considerable amount of timber of good merchantable value that is either unharmed or of which the bark is only slightly scorched. On the east side about half the area available for cultivation is in timber berth 532.

The soil is generally light, reddish, whitish or brown sandy or clayey loam with a great abundance of stones and gravel throughout. There are, however, depressions between the slopes where a heavier and richer deposit has been made that would be adapted for the cultivation of certain products of agriculture in a high degree.

The special climatic conditions consequent upon the close proximity of the extended water surface of the lake render them very suitable for farming and fruit growing and, owing to the frequent passage of rain clouds up the trough of the lake, it is not considered that irrigation is a necessity; although, where available, it would be a fruitful adjunct.

PASS CREEK.

The valley of Pass creek, flowing into Adams lake at the westerly extremity of Agate bay, is narrow, about half a mile wide, and enclosed by very steep hillsides. It practically comprises a flat along the creek, rising gently to the steep slopes. It is very fertile, as is shown by the heavy growth of cedar, fir and undergrowth. All is within timber berth 233 except a portion of sec. 1, township 25, range 14. The soil is a rich, brown and reddish sandy loam with small stones and fine gravel, becoming more stony as the steep hillsides limiting the valley are approached. Along the creek the soil is much enriched by a layer of vegetable mould. There is a considerable body of good merchantable timber here, cedar to 40 inches diameter and over directly along the creek, and fir to 36 inches diameter, while on other parts not so close to the creek there is a general scattering of fir and cedar, the former to 20 inches and the latter to 15 inches diameter. The slopes on the north side show many opens of bunch grass with scattering scrubby fir, which are well suited for grazing stock; above these are rocky bluffs timbered with scrubby fir and spruce. On the south side the steep slopes are clad with second growth of poplar, birch, willow and scattered bunches of scrubby fir to 15 inches diameter.

Chas. Todd is squatted on the SW. $\frac{1}{4}$, section 29, township 24, range 13. He grows splendid potatoes and other vegetables which show the fertility of the soil, although it is largely mixed with fine gravel. He does not irrigate. The lumber company operating at the mouth of the river obtain from him all the potatoes needed for their camps at the head of the lake. A good Government wagon road travels up the valley from the end of the bay to connect with Kamloops. The Adams River Lumber Company ply a large stern-wheel steamboat between the two ends of the lake to carry supplies to their camps. It has considerable passenger accommodation.

D. Slaven (?) has a homestead on SW. $\frac{1}{4}$, section 1, township 25, range 14, and the valley provides opportunities for a number of others. Directly opposite Agate bay is a small area of bench land 500 to 800 feet above the lake. It is much broken, and the soil is generally stony. There is not much timber of merchantable value upon it, the most valuable being bull pine to 24 inches diameter, and a scattering of fir to 20 inches. Portions of it might be utilized for agriculture if it were more accessible, but there would be considerable difficulty in constructing a road to it. A steep drop off along the lake shore rather isolates it.

ADAMS LAKE BELOW PASS CREEK.

The only land between Pass creek and the outlet of the lake that can be called agricultural consists of a small flat and bench at Bush creek, where there is probably room for one settler, and on two points across the lake on the east side, where F. H. Waldrip has squatted on parts of SW. $\frac{1}{4}$, section 25 and SE. $\frac{1}{4}$ section 26, and E. W. Sturgill on the SE. $\frac{1}{4}$, section 24, township 23, range 13. With these three exceptions there is nothing but some doubtful slopes until immediately opposite the Adams Lake Indian reserve, which lands are dealt with in D. L. S. McCaw's report. Concerning those referred to, they are of small area and are flanked by steep hill slopes, not suited for agriculture. On the east side these slopes show grassy opens which can be utilized for grazing purposes. The soil throughout is brown sandy loam with plenty of gravel and stones, more stony in places. The timber is small birch, fir, cedar, poplar and willow, with a scattering of fir to 20 inches diameter and bull pine to 24 inches, of lumber value. The land on the west side is within timber berth 233. All the above classified land is shown on the map accompanying D. L. S. McCaw's report.

ATTACHMENTS.

Submitted with this report is a schedule of the lands examined, by section, township and range, giving in detail full particulars of each parcel. There is also a schedule of areas for fruit lands, farm lands and grazing lands, respectively. A table of temperature taken while the work was in progress, and a list of squatters found on the land is also appended.

DATUM.

For land on Shuswap lake the average altitude above sea-level of the lake surface, 1,150 feet, is used as a datum.

For lands on Adams lake the average altitude of that lake surface, 1,360 feet, is used.

All altitudes given are referred to the above.

ADAMS LAKE AND ADAMS RIVER; LITTLE SHUSWAP LAKE; NORTH OF SOUTH THOMPSON RIVER.

Report by R. D. McCaw, D.L.S., season 1909.

Townships included in the following report:—Range 10, township 21; range 12, township 22, 23; range 13, township 20, 21, 22, 23; range 14, township 19, 20; range 15, township 20, 22, 23, all West 6th Mer.

SIR,—I have the honour to submit the following report containing general information regarding the lands north of the South Thompson river, examined by me during the season of 1909 in the Railway Belt of British Columbia.

ADAMS LAKE AND RIVER VALLEY.

The first base of operations in this territory was the valley of Adams river and the south part of Adams lake. At present the greater part of undisposed of lands in this valley and in valleys tributary to the main valley is in timber berths, which

accounts, no doubt, for the absence of settlers. The land along the north part of the river rises in a succession of broken benches on each side of it, and these terminate in steep hills which are useless for cultivation. Again, along the river and farther south, steep slopes come down in many cases to the water's edge. To the east there is but a small area of available land, while to the west there is much more and especially along Hiuihill creek which empties into Adams river in section 32, township 22, range 12. In township 22, range 13, there is a great deal of swamp land along aforesaid creek, which in its present condition is useless. However, with the amount of fall found in the creek, drainage will be very easy to obtain, and once drained and cleared will become very productive. The slopes farther back, north and south are nearly always workable to the base of the steep rocky slopes.

The soil varies, and often in the same quarter section two or three classes of soil will be found. Generally the slopes and benches have a light sandy or clay loam, often light clay alone. Field stone and small boulders are found in more or less quantity all over, and rocky outcrops appear, especially on the steeper slopes towards Adams river. In valley bottoms the soil is often a rich, black loam and covered with humus of decaying vegetation. Underneath this is usually found the soil aforesaid.

The limit of altitude of successful fruit cultivation in this district will not exceed 600 feet above the main valley of the Adams river and lake. However, in the valley of Hiuihill creek, good workable slopes occur above this altitude and which have been classed as farm land.

It is rather doubtful if irrigation is absolutely necessary for successful growth in the vicinity of Adams river and lake, although in some cases the slopes and benches would no doubt benefit from it. The precipitation of rainfall in this district would seem sufficient for all agricultural purposes, but if it is deemed advisable to use artificial means, the water of Hiuihill creek is available on the west side of Adams river and Nikwikwaia creek on the east side. Areas rising in altitude to 800 feet above the Adams lake valley could be irrigated by these means.

As mentioned before, nearly all of this land is in timber berths 263 and 482. In the latter the timber has not been logged, and much merchantable material exists. On some quarter sections the quality is not as good as on others and often the good trees are scattered, but generally there seems to be sufficient timber to be of profitable value. The growth is often very dense, especially in the valley of Hiuihill creek. In berth 263 the value is not nearly so great, and much of the timber has been logged and in many cases damaged by fire. No doubt the existing timber in some cases a fair value, but often it has value only as cordwood or for farm fencing. In this timber berth (263) on the W. $\frac{1}{2}$ of SE. and E. $\frac{1}{2}$ of SW. quarters of section 7, township 23, range 12 is squatted by F. H. Sturgill. There is little timber of merchantable value on this land, and Mr. Sturgill is anxious to obtain entry.

VALLEY OF SOUTH THOMPSON RIVER. (LITTLE SHUSWAP LAKE TO KAMLOOPS.)

As we travel westward along the South Thompson river conditions change very much, the country becomes more open and in some cases whole quarters and occasionally whole sections occur without any timber growth. Much of the good quality of land has been disposed of, and numerous settlers are growing profitable crops. In township 20, range 14, there is much workable land rising in rolling slopes from benches along the river. In township 20, ranges 15 and 16, steep rocky slopes rise almost directly from the lower bench north of the river, and very little land of agricultural value was found. In the valley of Pinantan lake and Paul creek, in the north part of township 20, range 15, a settlement of Italian farmers is located, who are growing fair crops of barley, oats, wheat and vegetables. The soil varies in character, and is generally a loam, often black and nearly always stony to some extent. Along the Thompson river, much light clay is found in the vicinity of the broken benches and clay cliffs which are a characteristic feature of the north side of the river in this locality. The subsoil on the higher slopes is generally gravelly and stony and in some

instances very porous. Evidences of alkali are found distributed throughout, but in no case does it occur in large enough quantity to be detrimental to cultivation.

In Pinantan Lake valley, farming was being carried on successfully at an altitude of 1,800 feet above the South Thompson river. Settlers in that valley stated that 2,000 feet would be the limit of successful cultivation. Summer frosts often occurred and spring was late and fall usually early. There was a distinct difference noted in the natural growth in this valley to that on the lower lands. Wild berries were three to four weeks later in maturing than on the lower lands. The different crops seen were healthy in appearance but were later than those found lower down. In township 20, range 14, the growing products looked well on the lower lands, but in higher altitudes seemed to be a failure, due to lack of moisture or the inattention of the settler. Very little fruit was seen in this district and it was usually on the benches adjoining the river and as high as 500 feet above it. At the north end of Niskonlith lake, at an altitude of about 600 feet above the river, a settler had a young orchard and was cultivating strawberries with great success.

There is a great deal of contention as to the necessity of irrigation in this locality. In some cases settlers are growing splendid crops without, and claim it is unnecessary. However, in most cases these settlers seem to have a favourable situation and the soil is usually a black loam. Again, others state that it is an absolute necessity and their crops most certainly give evidence that water is needed. At present dry cultivation is being tested in this district and, if found successful, will undoubtedly make valuable, lands that are at present considered worthless by the incoming settler, since irrigation is a most difficult problem in this part of the Dry Belt. The main sources which can be used are Niskonlith lake, Paul creek and the Niskonlith river, but works would be expensive generally. In a few instances, in the low benches along the South Thompson river, irrigation could be obtained by pumping from that stream.

Grazing exists over a large area throughout, and at present much land is under grazing lease. In many places 20 acres is insufficient for one head of stock. Bunch grass, and pine grass is the main growth on grazing lands, with some pea vine on the higher slopes. The pine grass is always found in timbered land, while bunch grass is seen in open country.

Two timber berths are located in this area. Berth 442 surrounds Paul lake, and berth 497 is west of Niskonlith lake and Loakin creek. A little land of agricultural value is found in 497, and none at all in 442. Much of the timber is untouched in these berths. Much timber exists in different places, which are not in timber berths. In township 20, ranges 14, 15 and 16 and which is of fair quality. Fir and bull pine are the predominant varieties and are often seen to 30 inches diameter. The bush is often very open, and again has a great deal of underscrub in places.

HARPER LAKE, LITTLE SHUSWAP LAKE, ADAMS RIVER AND LAKE, MEADOW CREEK, MARA LAKE, SALMON RIVER, INGRAM CREEK AND GRAND PRAIRIE.

Report by Jos. E. Ross, D.L.S., season 1909.

Most of the land surveyed lies in the back valleys on the hills at an altitude ranging from two thousand to four thousand feet above sea-level, and is, I am somewhat reluctant to say, not suitable for general farming. The soil is not good, and the surface is much broken or hilly, but apart from this the many difficulties to be contended with, such as long hauling to the markets over heavy grades, lack of water for irrigation purposes, and summer frosts, preclude the possibility of carrying on mixed farming successfully. Stock raising and dairying are the only branches of the industry that might be engaged in with profit, and these only on a small scale.

On March 15, I left Kamloops with my party to complete the survey I had left unfinished the previous season at Harper lake, where eight settlers had squatted. The

land settled on consists of good bottom land, thickly wooded, and rolling hills lightly timbered. The settlement lies about four miles to the south of Shuswap station, at an elevation of about one thousand feet above the latter place. There is only a rough trail at present between the two places, but the settlers claim to have located a good road with easy grades that can be built at moderate cost. All the suitable land is now taken up.

From here I moved to Little Shuswap lake, where I retraced the boundaries of Little Shuswap Indian reserve and surveyed the adjoining quarter sections. The boundaries of the Indian reserve follow closely the foot of the high mountain to the south, leaving the strip of good land between so small that it is scarcely worth taking up.

My next move was to a small creek flowing into Adams river on the westerly side. I surveyed five or six sections here lying along the creek. About three miles up the creek there is a marshy meadow and considerable bottom land. With some drainage several sections could be brought under cultivation. There is some very large timber, cedar and fir, in this locality, which is included in a timber berth. Two settlers had camped here for a short time, and made some improvements, but apparently had abandoned them. The elevation above Adams river is about four hundred feet. At present there is only a pack trail, but a good road could be built at moderate cost. The lumber company will probably lead the way by making roads and clearing off the heavy timber.

The enterprise of the Adams River Lumber company is very much in evidence in this district. At the foot of Little Shuswap lake a large sawmill, fitted with the most modern machinery, has been built, while nearby, across the railway track, a townsite has been laid out upon which the new town of Chase is fast springing up. Waterworks were being put in at the time of the survey. A steamboat and a launch or two have been placed on Shuswap and Adams lakes for the company's private use. A good road, six miles in length, has been built between the two lakes, and a telephone line follows along this road. Adams river has been much improved for log driving, and a most substantial dam constructed near the head of the river. On Upper Adams river, where the bulk of the company's timber lies, equally extensive improvements have been made. The large expenditures made would indicate the company's intention to operate here on a large scale for many years.

After traversing the right bank of Adams river and a part of the east side of Adams lake, I moved to the foot of main Shuswap lake. Between the lake and the high mountain to the south there is a considerable stretch of good land which has been taken up since the 'days of construction,' and is now thickly settled. The old survey was not altogether complete; I ran out the few necessary lines, completing the survey as far as Notch hill.

My next work was on the opposite side of the lake where I extended the old surveys up Meadow creek as far as Scotch creek valley. Three settlers have squatted here and are making fair progress. The bottom land along the creek is good, but the high land appears to be rather dry for farming.

My next camp was pitched on Mara lake. The land surveyed here lies along the east side. There is no road on this side of the lake, but Sicamous, the nearest station on the railway, can be conveniently reached by water. It seems strange to see, close to Sicamous, a considerable area of good farm land still in its primeval state. This farming land is held in provincial lots. The only reasons I can think of for no use being made of it are that it is held for speculative purposes, and that the mosquitoes make life scarcely worth living for about two months in summer.

I next made a survey in township 21, range 9, where a small creek flows into the Salmon arm of Shuswap lake. I carried the survey along the creek for several miles. There are two quarter sections along this lake suitable for farming. There is no road

on the north side of the lake here, the only route being by water. Salmon Arm station and Sicamous Junction are the nearest railway stations.

On finishing the survey here, I went up Salmon river, making small surveys en route and establishing the boundary of the belt where practicable. At Ingram creek I carried the survey to the boundary of the belt where I found that a large meadow had been partly taken in provincial lots. The meadow is about two miles long and about a quarter of a mile wide, and the greater part of it lies within the belt. Farther up the creek, on a tributary, there is a smaller meadow. This has been squatted on by a settler holding a provincial pre-emption record. Outside the two meadows and the margin of bottom land surrounding them there is no land for settlement. The altitude is about four thousand feet above sea-level. A pack trail follows along the creek to the meadows.

From Ingram creek I moved to the end of the original surveys on Salmon river. From here I ran south to the boundary of the belt and connected with the survey made at Ingram creek. I then carried the survey up Salmon river to the east boundary of the Monte Hills forest reserve. From the latter place I ran a traverse along the river road to the boundary. Up to the reserve there is a narrow strip of good bottom land, but from here the mountains come down steeply to the river. Grande Prairie, the oldest and best settlement in Upper Salmon river valley, is ten miles long and from a mile to three miles wide. It is perfectly level and the soil is very productive. The farmers, however, do not seem to be so progressive as in other parts of the district, probably on account of the lack of railway facilities. A syndicate were negotiating a deal by which they would acquire most of the land in the settlement. Their intentions were to subdivide the land into small holdings, and sell on easy terms of payment. In this way a much larger population could be accommodated. The syndicate proposed to put in an electric railway from Vernon and to build a large sawmill in the valley. It is to be hoped that the deal will be consummated, and the proposed projects carried out, as it would be a boon to the whole valley.

From Salmon river I went to Paxton valley, where I made subdivisions on both sides of the valley. In sections 9 and 10, township 18, range 13, there is a small meadow and some good bottom land, but generally the land is not well adapted to farming. The scarcity of water and the distance from market will probably prevent the land from being settled on, for the present, at least.

After finishing the work in Paxton valley I made small surveys at Campbell creek, Back valley, Louis creek and Edith lake, all lying within a radius of thirty miles from Kamloops. The conditions and character of the country are very similar to those of Paxton valley and therefore will not require any particular description.

The weather conditions throughout the season were favourable for surveying, but the spring and early summer were too dry and cool for a good growth of vegetation. The hay crop was much below the average, but the grain crop was fair. On the hills the crops were the best for many years.

Except at Mara and Carlin we saw no damage done by forest fires this season. On the whole the losses from fires must be much smaller than for many years. This is, no doubt, mostly due to the watchfulness of the fire wardens, but the new provincial regulations, by which a farmer must get a permit before setting out fire for clearing land, should also be a help.

EAGLE RIVER VALLEY.

Report by E. W. Robinson, D.L.S., season 1908.

SIR,—I have the honour to report that in accordance with your instructions I left Ottawa on April 18, 1908, proceeded to Kamloops, B.C., and consulted with Messrs. J. E. Ross, D.L.S., and T. H. Plunkett, D.L.S., as to the division of surveys projected

in the Kamloops district. After discussion it was decided that Mr. J. E. Ross should undertake the work in the neighbourhood of Kamloops, Mr. T. H. Plunkett from Golden westerly, and that I should work from Sicamous Junction easterly.

I accordingly organized my party at Kamloops, and on May 1 moved to Sicamous Junction. I proceeded from there about 4 miles northeasterly along the valley of Eagle river, camped in section 17, township 22, range 7, west of the 6th meridian, and completed the surveys in this township.

Eagle river valley, having an elevation of about 1,200 feet above sea-level, runs approximately in a northeasterly and southwesterly direction and has an average width in the township of from 40 to 60 chains. Eagle river empties into Shuswap lake near Sicamous Junction; it averages about two and one-half chains wide and the current in high water runs about 4 miles per hour. There are rapids and sandbars in places, making the river generally unnavigable, although it is possible in low water to pole up in a canoe.

The soil in the valley bottom is sandy loam about 12 inches deep overlying a sandy clay subsoil. Samples of both the soil and subsoil have been analyzed and the report states that they are both excellent. Sloughs and marshes occur all through the valley. These when drained could be used as hay meadows. The side hills bordering the bottom land are usually too steep and rocky to admit of successful cultivation, but benches can be found here and there that could be utilized. The soil on these benches is usually richer than the bottom lands.

This valley seems well adapted for fruit growing and mixed farming; no summer frosts were experienced, and the land being well watered and out of the "dry belt," no irrigation should be necessary. A fire having run down the valley some years ago, very little large timber is left; an occasional strip of cedar, hemlock, fir and pine is found, while the remainder is covered with second growth of the above varieties, with poplar, birch and willow along the river banks.

Leaving the valley on June 18, I proceeded by gasoline launch and boats to the north shore of the main Shuswap lake, pitching camp near the mouth of Manson creek in section 14, township 23, range 10. I was instructed to connect block II of timber berth No. 240 to the township surveys. Considerable difficulty was experienced in locating this block, as it had been logged, of which I had not been informed, and fire had subsequently run over it. The soil through the southern portion of this township varies from a rich black muck with clay subsoil to a sandy loam with gravel subsoil. There is an excellent bench from one-half mile to one mile in width lying about one-half mile from the shore. Several settlers have taken up homesteads here and although none of them have very much land under cultivation, their efforts so far have been crowned with success. Standard fruits and strawberries seem to do especially well, and in view of the results obtained here and in other sections of the Shuswap lake district where fruit growing has been practised for a considerable number of years, I am of the opinion that Shuswap lake will prove to be one of the best fruit-growing sections of British Columbia.

Leaving here on June 26, I returned to Sicamous Junction and from there went about 2 miles east to the south side of Eagle river where I commenced the survey of timber berth No. 528, block V. This berth takes in the greater portion of the valley of Owlhead creek, a tributary of Eagle river, and, extends southerly up the mountain side, reaching to Cariboo plateau.

The valley of Owlhead creek is well timbered with cedar, hemlock, Douglas fir and white pine. Another belt of good timber is found about 1 mile west of the northwesterly corner of the limit, and consists of hemlock, cedar and Douglas fir. The interior of the limit is largely second growth with occasional large trees of fir and tamarack. There is also some good cedar, hemlock, fir and pine lying to the north of the northerly boundary of the berth and principally in the following sections: northeast quarter of section 4, southeast quarter of section 9, south half and northeast quarter of section 10, northwest quarter of section 11, and northwest quarter of section 12, all in township 22, range 7.

The only land having any agricultural value lies along the valley of Owlhead creek. The soil consist of 18 to 24 inches of rich black muck with a subsoil of gravelly clay. A small quantity of slough hay could be cut in the beaver meadows at the head of the two branches of this creek. Approximately 50 acres in all could be used, although this would necessitate some improvements in the way of drainage and clearing.

On September 30, I moved to Malakwa, B.C., and started work in township 23, range 6, adding on sections to the existing surveys. Fire has run through the valley destroying most of the timber, consequently the clearing of the land would be comparatively easy. The soil is a sandy loam with considerable surface rock. The side-hills bordering the valley are covered with second growth fir, cedar, spruce and pine, with poplar and willow in places. They are usually too steep to admit of profitable cultivation, although small benches exist which might be utilized, the soil usually being a rich loam. Summer frosts occur occasionally but as a rule are not very severe, and these would probably disappear when all the adjacent land is under cultivation. Mr. Wolsey, the postmaster, a resident here for about twelve years, states that he has never had a failure with his strawberry crop. The land seems best adapted for mixed farming Revelstoke providing market for all produce.

On October 19, I moved to Craigellachie, which lies in the east part of township 23, range 6, and commenced the surveys there.

The valley of Eagle river in this district is from 40 to 70 chains wide, narrowing down to a few chains at the confluence of the north fork and the main stream. Fire has run over a portion of the valley, but leaving generally a strip of good timber, consisting of cedar, spruce, hemlock and fir along the river bank. Over the burnt area, poplar, birch, alder and willow is now growing. The soil is a rich sandy loam from 9 to 12 inches in depth, overlying a sandy clay subsoil. The land is marshy in places, caused largely by beaver dams, but any portion could be easily drained, there being a gentle fall to Eagle river. The river apparently overflows its banks at extremely high water. The land appears to be well adapted for mixed farming; dairying in particular should be very successful as the rainfall seems to be large and consequently good pasturage could be maintained. We repeatedly had heavy rain showers, during which 3 or 4 miles down the valley no rain fell. The sidehills on the north side of the valley are steep and sparsely covered with small cedar, fir, poplar and willow. The soil is a light sandy loam with a large amount of surface rock and apparently of little value for agriculture. Over the sidehills, on the south side of the valley a severe fire has run in some places almost sweeping the land clean. Portions of this could be used for agricultural purposes as the slope is not excessive and some good level benches exist.

On November 30, I moved to Griffin lake, in township 23, range 4, to traverse Eagle river, across sections 19 and 20.

The valley here is narrow and has been fire swept. Small second growth poplar and birch have commenced to cover the land. The soil is a sandy loam and very rocky. Summer frosts are reported to be prevalent. The land would make fair pasturage and dairying might be successful. A good market for any produce would be the lumber camps and saw-mill on Three Valley lake, about 3 miles distant.

On December 4, I moved to Revelstoke, and from there about 3 miles down Columbia river, camping on the west side of the river. I traversed the west bank of the Columbia, in township 23, range 2, together with the islands in the river, but was unable to complete all the work outlined in this township, owing to inclement weather and the depth of snow.

The land on the west side of Columbia river is rolling with a moderate slope from the river back to the foot of the mountains.

Most of it is well timbered with cedar, spruce, hemlock and pine, although in places fire has run over it some years ago, and this portion is now covered with dense second growth of the foregoing varieties, consequently the clearing of the land would

entail considerable expense. The soil is a sandy loam with some surface rock showing as one approaches the base of the mountain.

The country seems adapted for mixed farming, and Revelstoke, a divisional point on the main line of the Canadian Pacific railway, would prove an excellent market for all produce.

The valley of Columbia river, south of Revelstoke, will no doubt eventually be a thriving agricultural country, as there is a considerable quantity of good land on both the east and west sides of the river.

At present access to Revelstoke by road from the west side of the Columbia is impossible. A wagon bridge, however, is under project to cross the river at Revelstoke and then with a wagon road down the west side of the Columbia, this objection will be overcome.

I closed the season's operations on December 30, moving into Revelstoke that day. On December 31, I proceeded to Kamloops and stored my outfit, and on January 2, 1909, left Kamloops for Ottawa.

SHUSWAP LAKE; COLUMBIA RIVER AT REVELSTOKE AND AT GOLDEN.

Report by T. H. Plunkett, D.L.S., season 1909.

My first work consisted of the survey of the easterly limits of sections 20 and 29, township 20, range 9, west of the 6th meridian. A considerable portion of these sections, particularly section 29, lies well up on the Larch hills and for this reason is almost useless for farming; it is useful, however, for grazing land. Along the base of the Larch hills in these sections there is some first-class farming land. In this district a quarter section is often applied for when ten to twenty acres would include all the land adapted to farming. The soil is so fertile that twenty acres is considered ample to afford the owner a good living. I found that the applications for land in this vicinity, which included land in sections 6, 16, 20 and 29, township 20, range 9, and sections 1, 2 and 3, township 20, range 10, west of the 6th meridian, were applied for in the hope of working from ten to fifteen acres for fruit lands and using the remainder, where the topographical features rendered farming impossible, for grazing land. The fact that homesteaders are willing to exercise their homestead privileges when they know that such comparatively small areas are all that they can expect to find adapted to farming operations is easily explained when it is known that land in the valley of Canoe creek between the Larch hills and mount Ida is selling at present from \$100 per acre for uncleared land to \$1,000 per acre for lands planted in orchards.

The climate is well adapted for the raising of fruit of all kinds. No summer frosts are to be feared, and the rainfall is sufficient for fruit raising and general farming.

Along the base of mount Ida there is a considerable quantity of merchantable timber, and a small saw-mill on Canoe creek gives the settler a ready supply of lumber for building purposes.

These remarks, regarding climate, summer frosts and timber supply, apply also to the land along Salmon river, where our next work led us.

The valley of Salmon river extends southwest from the shore of the Salmon arm of Shuswap lake up along Salmon river between mount Ida and the Spa hills. This valley at the town of Salmon Arm attains a width of from 6 to 8 miles, but gradually narrows to a mile or two in width as it ascends the river.

The beautiful dairy and fruit farms, especially those in the vicinity of the town of Salmon Arm, present in summer a picture well worth the effort necessary to scale mount Ida, from whose first benches a remarkable view of the whole country can be had.

However, all the bottom land in this valley having been taken up, the new settlers are turning their attention to the extensive bench lands. Mount Ida, on its

eastern slope, facing Canoe creek, rises somewhat precipitously, but on its western slope above Salmon river are to be found large benches. This is even more characteristic of the Spa hills on the opposite side of Salmon river and particularly so in sections 6 and 7 of township 19, range 10, sections 30 and 31 of township 18, range 10, and sections 13, 14, 23 and 24 of township 18, range 11. It was in these last-mentioned sections that most of our work this season was located. A number of settlers are already squatted on this land making a success of mixed farming, but fruit farming has as yet not been given a trial. The soil is not so rich as that in the bottom lands, being inclined to be sandy, but when irrigated, however, it is found to yield abundantly and no doubt in the near future will afford ample evidence of its value as a farming and fruit raising district.

Water for irrigation which is absolutely necessary on the benches is easily available from the numerous streams flowing from mount Ida and the Spa hills, into Salmon river. A considerable portion of the land is still open for intending settlers, while in the valley some first-class land is offered at prices which, considering its producing value, seem reasonable.

The bench lands are wooded with scattered bull pine, while in the bottom lands merchantable cedar, fir and spruce are to be found. Logs can be driven on Salmon river to saw-mills which are in operation along the river nearer Salmon Arm.

The land in sections 29 and 32 of township 20, range 10, is also bench land. Some beautiful farms and orchards are to be found in this locality west of Adams Lake and Neskainlith Indian reserves. Here one has ample proof that irrigated bench lands scarcely take second place to the bottom lands in point of worth as producers of farm and orchard products.

Nestled in the midst of the districts just described and ideally situated on the slopes overlooking Salmon arm of Shuswap lake lies the thriving town of Salmon Arm. Situated on the main line of the Canadian Pacific railway, this town affords a ready and convenient market for all kinds of farm, garden and orchard produce for the raising of which the land in its immediate vicinity has proved itself well adapted. Good roads lead from the town of Canoe Creek and Salmon River valleys as well as to the lands west of the Indian reserves.

At present, ample employment is afforded at Salmon Arm at the building trades, and also in the saw-mills and lumber woods in the vicinity.

Salmon abound in Salmon river during the annual run, and plenty of trout are always to be had in the Shuswap lakes. Bear, deer and mountain goat are also plentiful in this district.

The Salmon Arm district, with its most favourable climate, good roads, splendid market and shipping facilities resembles very much the famous Okanagan district to the south and east of it, and bids fair in the near future to successfully rival the Okanagan as a fruit-raising district.

After completing the surveys around Salmon Arm we took the Canadian Pacific railway for Revelstoke where the survey of fruit lands along Columbia river south of Revelstoke occupied us for the next few months.

COLUMBIA RIVER, REVELSTOKE.

Commencing about 24 miles below Revelstoke these fruit land surveys were carried on in the valley of Columbia river up to within a mile or two of the town of Revelstoke.

The bottom lands in the valley range from a mile and a half to two miles in width. Generally speaking the land is covered with a dense undergrowth and heavily timbered with very large cedar from 4 to 12 feet in diameter, and hemlock from 3 to 4 feet. The soil in some places consists of a rich black loam, but generally speaking it is inclined to be sandy. There is no doubt but that the land is well adapted to fruit farming. During the present season small fruits, such as currants and strawberries, though as yet only raised in small quantities, were of exceptionally high order as regards size, colour and flavour. In only one locality in this valley has

apple and plum growing been attempted as yet, namely, in section 29 of township 20, range 29. The orchard is from ten to fifteen years old, and the returns have been exceptionally good. Conditions are the same as those in the upper portions of the valley and no doubt bespeak success for this district as a fruit country.

On the other side of the bottom lands extensive benches have been subdivided. The clearing is easily done, the timber consisting of small poplar, spruce and birch, with some brush. The soil, generally speaking, is a sandy loam with a gravel subsoil, and irrigation either on the benches or in the bottom lands is not necessary. Summer frosts do not exist. The winters are sometimes cold but the exceptionally heavy snow-fall in this district, coming before the frost has entered the ground to any considerable depth, ensures the successful protection of the orchards from frost, keeps the ground warm and gives an important stimulus to spring growth.

The river is navigable throughout this district, and the Arrowhead branch of the Canadian Pacific railway following the left bank of the river affords excellent transportation facilities. Wagon roads have as yet not been constructed farther than 6 miles below Revelstoke.

Excellent markets for farm and garden produce of all kinds are already established at Revelstoke where the demand far exceeds the present local supply, while there is, with the present facilities for shipment to the prairies, no chance of an over production.

Plenty of employment at good wages is to be obtained in the mills and lumber woods during the entire year. Three large mills are in operation at Arrowhead, while the town of Revelstoke, where two large lumber mills are located, presents plenty of employment in all trades.

Concurrently with this work, we were engaged on timber berth surveys on Cranberry creek. There are a few fairly good locations for homesteads on this creek, but the quantity of farming land is limited.

COLUMBIA RIVER, GOLDEN.

Our next work was in township 25, range 20, west of the 5th meridian where we were engaged for a short time surveying sections 19, 20, 21, 28 and 29, and in section 36, township 24, range 20, and sections 30, 31, 14, 15 and 16 of township 24, range 19.

The work in this district was all on the benches where farming operations are as yet in the experimental stage. Summer frosts are here met, and irrigation is necessary during some seasons.

During our surveys here we noticed small patches of vegetables planted by someone desiring to test the producing power of the soil and the effect of the summer frosts. It was evident, however, that the experiment had not received as much attention during the growth of the vegetables as would have been advisable. However, it shows that the attention of settlers is being drawn to these benches which offer good opportunities to settlers, if the summer frosts are not too severe. In most places plenty of water is easily available for irrigation.

A first-class wagon road from Golden up the valley to the Windermere district, affords the settlers exceptionally good transportation facilities by land while Columbia river is navigable and steamers run tri-weekly between Golden and Windermere. A railway up the right bank of the Columbia river is now under construction.

Employment in the lumber woods along the river is obtainable during the entire year while a large modern mill at Golden also affords work.

We next moved to the mouth of Blaeberry creek in section 30, township 28, range 22. Our work in this locality consisted chiefly of traverse work on Columbia river.

The climatic conditions are about the same as those just described in townships 24 and 25, ranges 19 and 20.

Some farming is being done, the principal crop being hay, for which there is always a large demand in British Columbia. A new departure is being made here in hay raising along the Columbia. Along this river there are, at intervals, large areas

of land inundated during high water, but which yield slough hay in large quantities in the fall. The trouble had been that during most seasons they do not dry up early enough to enable the hay to be harvested. At the mouth of Blaeberry creek there is an exceptionally large area of this slough hay land. The owner has constructed a system of ditches leading to the Columbia river through which the water is enabled to flow off quickly, as soon as the river drops. The slough in this way is sufficiently dry in the fall to permit of harvesting operations. It is found that if the hay is stacked in small stacks immediately after its being cut it cures in first-class condition and makes excellent fodder. A ready market already exists at the coast for this class of hay, and it would seem likely that quite an industry could be built up by working the areas on this river. The land east of the railway has been retained as a timber reserve.

ADAMS LAKE; COLUMBIA RIVER VALLEY AT REVELSTOKE; AND SHUSWAP RIVER.

Report by E. W. Robinson, D.L.S., season 1909.

As one travels westerly through British Columbia it is somewhat remarkable how the climatic conditions change within a short notice. For example, at Revelstoke, where I remained one day to purchase supplies, a foot of snow was still on the ground, the atmosphere was chilly and the country generally had a wintry aspect. Proceeding westerly the snow grew less until at Sicamous, on Shuswap lake, the ground was bare. The vegetation also shows a marked difference. The rank growth of alder, willow and other brush which characterizes the valleys in the Revelstoke district gives place to an open growth of the different varieties of the coniferæ, indicating less precipitation. As one proceeds farther west the change is still more marked. The timber becomes more scattered, deciduous trees disappearing almost entirely until Kamloops is reached. Here one is in the heart of the Dry Belt, where the hillsides support only a growth of bunch grass and sage brush with scattered bull pine. The precipitation here is so small that irrigation has to be employed for all crops. On the date I reached Kamloops I found that spring was well advanced, in fact, farming operations had been in full swing for several weeks. The short duration of winter in the Dry Belt is one of the many attractions which prove so alluring to newcomers.

After consulting Mr. J. E. Ross, D.L.S., and discussing the division of work outlined for the season, I organized my party and left.

Timber berth 532, for the survey of which I received instructions, lies on the east side of Adams lake. It extends in an easterly direction, crossing the divide between Adams lake and the north fork of Scotch creek, thence down Scotch creek slope and crossing the north fork of Scotch creek, rises from half a mile to two miles up the opposite slope of this creek. The major portion of the timber lies in the valley of Scotch creek; fires have destroyed what was once a magnificent belt of timber on the Adams lake slope, but there are still a few patches left, principally Douglas fir, hemlock and a little white pine. These patches, unfortunately, are very scattered, making the logging expensive. Stretching along the summit between Adams lake and Scotch creek excellent spruce is found up to 30 inches in diameter, with second-rate balsam up to 24 inches. As one descends the Scotch creek slope the balsam soon disappears and cedar and hemlock are found. A few cedar up to 20 inches were discovered to be sound, but the majority are "hollow butts." The hemlock will average about fifty per cent unsound, with a greater proportion than this at lower altitudes. The Douglas fir and white pine are the best of the varieties of timber in this limit, the fir reaching a size of 60 inches and the white pine 40 inches. The white pine, although scattered, as is generally the case in this section of the country, will run more to the acre than the average for this part of British Columbia.

The logging of the Adams river slope will not present much difficulty apart from the scattered nature of the timber, as the land is not very steep and the logs can be readily rafted on Adams lake. The Adams River Lumber Company tow their log rafts to the south end of the lake where they have a dam across the mouth of Adams river. They drive Adams river to Shuswap channel, and through this to the western end of Little Shuswap lake, where their mill is located. The logging of Scotch creek slopes will be more difficult. It would be possible to take the timber from the higher land on the west side of Scotch creek to Adams lake through a low pass which is approximately in the southwest quarter of section 20. This would, however, entail a long haul, especially from the northern part of the limit. The most obvious route is, of course, via Scotch creek to Shuswap lake. This creek, although averaging from 75 feet to 200 in width, is not well adapted for log driving. It is crooked, has low land adjoining, which is flooded at high water, numerous obstructions, such as rocks, rapids and sand bars, and although it has a large volume of water in the spring, it would be difficult, if not impossible, to hold it back until required. This, coupled with the cost of clearing Scotch creek, renders this route a poor one. Possibly a logging railroad along Scotch creek would be the best method, as this would tap other valuable timber claims.

The soil is light sandy loam with considerable surface rock on the steeper slopes. The only land of any agricultural value lies on the Adams lake slope close to the lake; the remainder is of too high an elevation. Mixed farming should be successful here, and the hardier varieties of fruit could be raised. On May 23 snow was found in the bush to within half a mile of the lake shore, although the heat on the shore was intense.

The only market at present for produce would be the lumber camps on Adams lake, as the distance from the railway is too great for profitable shipping. Caribou, deer, black bear, lynx, marten and the smaller fur-bearing animals are fairly numerous, and Adams lake is well stocked with rainbow, grey and Dolly Varden trout, char and a few other varieties of fish.

COLUMBIA RIVER, REVELSTOKE.

On May 27 I proceeded to China flats, about 25 miles north of Revelstoke, to undertake without delay the survey of fruit lands in the Columbia valley. The land suitable for agriculture and fruit growing north of Revelstoke may be roughly divided into three sections: First, the Jordan flats, being alluvial land lying between Jordan and Columbia rivers with a strip of bench land along the west side of Jordan river; second, some bench land on the east side of Columbia river lying in sections 9, 10 and 15, township 24; third, a strip of alluvial and bench land averaging half a mile in width lying north along the east bank of Columbia river and stretching from the north boundary of section 3, township 26, to the northern limit of the Railway Belt. There are also a few isolated patches of good land, the two largest lying along the north boundaries of sections 23 and 26, township 24, the first one being known as Steamboat or Mosquito landing.

A stage road starts from Revelstoke and follows the east bank of Columbia river to Steamboat landing, a distance of about 6 miles, connecting with the Provincial Government pack trail, known as the "big bend trail" which continues north. A steamboat during the summer months is operated on Columbia river, starting in the earlier part of the season from Steamboat landing, and in the latter part from the city wharf at Revelstoke.

Columbia river through this section of the country is a swift stream with numerous sand bars, rocks and rapids, making navigation difficult and often risky. Lining up is employed to get up the worst rapids. The steamboat, which has a powerful steam winch in the bow, is first moved to the river bank below the rapids and a cable taken out along the bank and fastened securely to a tree or rock ahead. The boat is then swung out into the current, and with the combined power of its engines and the winch hauling on the cable manages to get through the rapids. The Provincial Government

is at present building a wagon bridge across Columbia river at Revelstoke, and this will connect with a pack trail around the "big eddy" on the west side of the Columbia, giving access to the Jordan flats.

The valley of Columbia river north of Revelstoke is well timbered with hemlock, cedar, Douglas fir, white pine and spruce. Fires have destroyed patches of timber all along the valley, approximately five per cent, which is considerably under the average amount destroyed by fire in the Railway Belt.

The soil consists of from 6 to 12 inches of humus overlying sandy loam subsoil. In a few low-lying spots and pockets there are 6 to 12 inches of rich, black muck with a heavy clay subsoil. Surface rock is showing, being specially noticeable on the steeper slopes. Mixed farming would undoubtedly prove successful, except on the Jordan flats, where the absence of creeks for irrigation would be a serious drawback during dry seasons. The hardier varieties of the standard fruits would flourish, and strawberries have been proved to be a very lucrative crop.

On July 24, I moved to the four-mile board west of Revelstoke to undertake the survey of timber berth 528, block 4. This timber berth is situated on the north slope of mount MacPherson, about 2 miles from Columbia river, and from 3 to 4 miles in a direct line from Revelstoke. There is at present no direct communication by wagon road from Revelstoke, but the Provincial Government is now constructing a wagon bridge across the Columbia to connect with the existing wagon road on the west side of the river which runs to within half a mile of the north boundary of the limit. At present the easiest approach is by crossing the Canadian Pacific Railway bridge over the Columbia, thence along the railway track to where the wagon road crosses at Griffith's ranch, situated three and a half miles from Revelstoke. From this point I cut a man-pack trail, going through Griffith's ranch and crossing Tonkawatla river which runs through the timber berth, touching the boundaries at several points. There is very little timber on the south slope of Tonkawatla River valley, a few scattered fir and hemlock having escaped the fire which at one time ran along the valley. The side-hill also is very steep with many precipitous rock bluffs, making the logging of any timber expensive if not impossible. Commencing at the summit between Tonkawatla river and its tributary south there is an excellent belt of timber consisting of hemlock up to 36 inches, cedar up to 7 feet, scattered white pine and spruce up to 24 inches, and occasional Douglas fir up to 30 inches. This belt of timber extends southerly to about the centre of section 18, where the cedar and white pine become scarcer, balsam up to 24 inches taking its place. Farther south the only varieties are spruce and balsam up to 24 inches. The extreme southern end of the limit being the part lying in the south half of section 7, is entirely useless, being portion of a rocky ridge cut up by ravines and rocky bluffs.

The logging of this limit will not present any difficulties, the only drawback being its distance from transportation. The slope to Columbia river is not very steep, and sleigh roads can be made quite easily. There is at present an old wagon road leading from the Big Eddy saw-mill to a ranch in the southeast quarter of section 20 which might possibly be utilized.

The soil is a sandy loam with considerable rock in places, but the altitude would prevent the growing of any but the hardiest crops. Along Tonkawatla river is some marshy bottom land which would be difficult to drain as its elevation is only slightly greater than that of the river. On August 20 and 21, I moved the camp down to the railway track, and on the 24th pitched camp on the Jordan flats to complete the survey of fruit lands there, a description of which has already been given.

On September 6 I moved to Greely on the main line of the Canadian Pacific railway east of Revelstoke, to survey timber berth 528, block 3 and to do adjoining subdivision work.

This timber berth is situated on the north side of Illecillewaet river from 4 to 6 miles east of Revelstoke. The easiest approach to the berth is by train from Revelstoke to Greely and thence across Illecillewaet river by the wagon bridge which is about

three minutes walk from Greely. There is also direct communication with Revelstoke by a wagon road which follows the valley of Illecillewaet river and passes through the southern portion of the timber berth. This road is in bad condition in some places, but the Provincial Government is now engaged in repairing and straightening it. The timber on this berth lies in two distinct sections. Commencing at the eastern boundary there is a belt about 30 chains wide and 85 chains long lying along the Illecillewaet river. This comprises hemlock up to 30 inches, scattered white pine up to 20 inches and cedar up to 36 inches. The hemlock will average sixty per cent unsound, and the cedar, especially near Illecillewaet river, is hollow and punky. Some excellent Douglas fir at one time existed on the limit, but it has been logged off. The other belt of timber, about two hundred acres in extent, occupies the northwest corner of the berth. This comprises Douglas fir, hemlock, white pine, cedar, spruce and balsam up to 14 inches in diameter. Practically all of this timber is sound, and although small will make good lumber. The remainder of the berth has been fire swept, the only other green timber being some small patches of hemlock up to 24 inches, and small white pine and cedar along the north boundary of section 4.

The bottom land along Illecillewaet river is a rich clay loam with black muck in places. It is marshy and would require draining for any other crop than hay. It was reported to me that in spring most of the land is flooded. The timber has been burned, second growth fir, cedar, hemlock with willow brush now covering the land. The sidehill on the north side of the valley is not very steep and several good benches exist. The soil is a light sandy loam with 6 inches of humus where the land has not been burnt. The bottom land after being drained and cultivated for a few years should prove ideal for vegetable growing. The sidehill land would undoubtedly raise fruit of the hardier varieties, although the soil is somewhat light, and manuring would be necessary. The precipitation in the summer is ample and the average snowfall is from 3 to 4 feet. Summer frosts occasionally occur on the bottom lands of the valley, but these will probably cease as the country is cleared and drained.

On October 7, I corrected the monuments on the east boundary of timber berth 528, block 4, according to instructions received. On the 8th I moved to Three Valley to survey the swamp lands lying in the south pass. I saw the applicant for these lands and he informed me that he had abandoned his application. I, however, inspected the lands and found that they comprised the head of a mountain valley about three and a half miles south of Three Valley and were about 1,500 acres in extent. A creek about 1 chain wide and 6 to 10 feet deep meanders through the valley and flows into Frog lake. The banks of this creek are low and beaver dams obstruct its course with the result that all the adjacent land is flooded.

It would be possible to divert this creek before it enters the meadows and by a short canal to carry the water across the low divide and connect with Three Valley creek flowing into Three Valley lake. If the beaver dams were then destroyed the land would speedily be drained and would make an excellent hay meadow. The soil is a rich black muck with a sandy clay subsoil, but it is doubtful if it could be utilized for tillable crops, as these narrow mountain valleys are almost invariably subject to summer frosts.

SHUSWAP RIVER.

On October 11, I moved to Armstrong in the Okanagan valley and camped in section 23, township 19, range 9. The Okanagan valley is in the Dry Belt, and irrigation has to be resorted to. Celery, onions and cabbage are largely grown and prove to be lucrative crops. The land surveyed in sections 13 and 14, 23 and 24, township 17, range 9, is all hillside and suitable only for cattle ranging. Dense second growth hemlock, pine and tamarack is commencing to cover the higher land. Good roads from Armstrong and Enderby run close to the above sections. On October 18, I moved by rail to Enderby and the next day by wagon along the Mabel lake trail to Kingfisher creek and camped there. This trail follows the valley of Shuswap river and in a dry season is in excellent condition; a prolonged spell of wet weather, how-

ever, will make it almost impassable, the soil in places being a stiff clay. Most of the available land in Shuswap River valley is taken up, the settlers being engaged in mixed farming and fruit growing. Apples seem to do particularly well. In sections 14, 23, and 22, township 19, range 6, there is a fine level bench the clearing of which would be easy. The soil is light sandy loam but as the summer rainfall seems to be ample would, with care, produce good crops. In sections 10 and 15 in the same township a gently sloping bench was found about 200 acres in extent with an excellent clay loam soil. The best timber has been logged off and clearing of the land would be expensive. On October 25, I moved the party to Falls creek and traversed Shuswap river through 2, township 19, range 7. On Falls creek a water-power exists capable of easy development. A head of six or seven hundred feet can be readily obtained. I did not, owing to a lack of time, investigate whether it would be possible higher up the stream to dam back the water until required. At this date the stream was about 50 feet wide and from 1 to 2 feet in depth.

On November 15, I arrived in Revelstoke to undertake the correction surveys on the west side of Columbia river, in township 23, range 2, west of the 6th meridian.

SHUSWAP LAKE AND MABEL LAKE.

Report by T. H. Plunkett, D.L.S., season 1910.

SIR,—I beg to submit the following report on my surveys during the past season in the Railway Belt of British Columbia.

In accordance with your instructions, I left Toronto on April 3, 1910, and proceeded to Kamloops, B.C. A few days were spent in repairing my outfit and organizing my party, after which, on the 13th, we left for Notch Hill, where by launch we crossed Shuswap lake and camped in township 23, range 10, west of the 6th meridian.

SHUSWAP LAKE.

Our work here consisted of the survey of suitable fruit lands in township 23, ranges 10 and 11. We found a large area of good agricultural land in township 23, range 10, lying along the northerly shore of Shuswap lake, and extending back an average distance of about 3 miles from the water. This land lies on two main benches. The lower with an average breadth of about a quarter of a mile, extends almost the entire width of the township, attaining at section 11 a width of about half a mile and narrowing gradually toward the eastern edge of the township, while at the western edge this bench entirely disappears.

Along the northerly limit of this bench there is a somewhat steep rise reaching at the western limit of the township an elevation of about 1,000 feet above Shuswap lake but rapidly becoming lower and of a much more gradual slope as its summit is traced easterly through the township. At the northeast corner of section 9 this rise attains an elevation of only 212 feet, with a slope so gradual as to permit of farming operations, and continues approximately at this elevation and slope to the eastern limit of the township, except in the westerly portion of section 10, where for a short distance it becomes rocky and precipitous.

North of the summit of this rise, lying on a gradual southern slope, is the larger and by far the more fertile of the two benches. It has an average width of about two and a half miles north and south, and extends the full width of the township east and west. This bench extends northerly to the base of the mountains, which, rising somewhat precipitously, render agriculture impossible any farther north.

Portions of the lower bench are naturally somewhat gravelly, lying so close to the lake, but in the south half of section 9 and in sections 11 and 13 some rich brown loam was found well adapted to fruit or general farming. Just below this bench in section 11 there is a limited area of bottom-land of a very rich brown or black loam.

On the upper bench, the conditions for agriculture are very favourable. The soil in sections 15, 16 and 17, and in the south halves of sections 21, 22 and 23, is for the most part a rich black loam with a gravel or gravelly clay subsoil. The remaining portions of the bench have a brownish loam soil with the same gravelly clay subsoil.

This district is, of course, a bush country. West of the east boundaries of sections 9, 16 and 21 the timber consists principally of fir, cedar and hemlock from 1 to 2 feet in diameter. In addition to these varieties, spruce, birch and poplar up to 18 inches in diameter are very plentiful. The undergrowth in this portion of the township is very dense, consisting of alder and willow brush with scrub maple; clearing is a very slow process. The fact that there are very few meadows where cheap fodder can be obtained renders it out of the question for the settler to provide himself with horses, and most of the clearing until now has been done by manual labour. In one or two cases where horses had been employed, the cost of their feed at prices in British Columbia, has compelled the settler to dispose of them. Although slow, progress in this district is nevertheless steady, and gradually the settler, convinced of the fertility of the soil, is carving out of the bush a comfortable home, and finding to his great satisfaction that a very small portion of land, probably from 10 to 20 acres, when cleared and looked after properly, will afford him and his family a good living.

East of the east boundaries of sections 9, 16 and 21 clearing is very much more easily done. There is in this portion a much larger proportion of poplar, small spruce and fir. On almost every homestead in this section of the township there can be found from 5 to 10 acres that can be easily cleared and very rapidly made to produce a living for the occupants of the land.

Agriculture in this locality is as yet in its infancy, but sufficient has been done to show the fertility of the soil. Vegetables of all varieties are being raised successfully. Small fruits yield abundantly, and the appearance of the fruit is excellent. Mr. H. A. Fowler's ranch in section 18, Mr. Blake's in section 11 and Mr. Beguelin's in section 16 demonstrate convincingly what the land in this township in general will produce. In addition to these there are several farms scattered well over the township in a more or less flourishing condition. Fruit raising has as yet not had time to develop, but almost without exception the settlers have planted small orchards which, although young, appear to be in a remarkably healthy condition, presaging the future development of the country along this line.

In township 23, range 11, we found a small portion of good farming land lying along the valley of Meadow creek, and extending northwesterly through sections 13, 23 and 24 to the valley of Scotch creek. The bottom lands are narrow, but the side slopes and lower benches can be utilized to some extent. Several fairly large meadows are found in these sections.

The soil consists of sandy loam with a clay subsoil.

The bottom lands are heavily timbered with fir, cedar and hemlock up to 4 feet in diameter, but the slopes and benches are covered with small fir, spruce, poplar and birch of no commercial value.

This land is elevated from 500 to 700 feet above Shuswap lake, and judging from the flourishing condition of Mr. Fowler's ranch adjoining it has a bright future as an agricultural district.

The climatic conditions in these districts are well adapted to fruit or mixed farming. Summer frosts are sometimes experienced. A severe frost this season, on the night of August 23, affected this district in common with nearly all portions of British Columbia, but from what information I could obtain this was very exceptional. As development goes on it can, I think, be safely assumed that the danger of summer frosts will be entirely eliminated. It is the practice in this district at present to delay the planting of potatoes and the more tender crops until the beginning of July, it having been found that the rapid growth during July and August causes the crops to develop so rapidly as to equal crops where seeding has been done earlier, and thus the danger of destruction by frost is eliminated.

With the removal of the forest growth, irrigation during some seasons will probably become necessary, as this district lies so close to the Dry Belt. However, in this respect, this locality is favoured by having excellent facilities for irrigation. Manson and Meadow creeks supply ample water, easily available. In addition, Manson creek presents several splendid water-powers.

Until recently, the settlers in the above-described districts have had difficulty in disposing to advantage of their farm produce, but of late, a regular weekly boat service has been established on Thompson river and Shuswap lake between Kamloops and Salmon Arm. These boats stop on signal anywhere along the shore of the lake to take on passengers or freight. The owners also supply the settlers with winter work cutting cord-wood and piling it on the lake front where the boat replenishes her fuel supply or carries the wood to markets along the lake. Several merchants from towns along the Canadian Pacific railway on the south side of Shuswap lake are now contemplating a gasoline launch service to trade with the settlers. At least one of these boats, owned by W. J. Smith of Notch Hill, is in commission, and two others, I understand, are to be put on in the coming spring.

Game, including deer, bears and lynx, is plentiful in this neighbourhood. The mountains to the north are a favourite resort in the fall for hunting parties in quest of big game.

Having completed our work in this locality, we moved to Adams lake, where, in addition to some traversing on the lake, we subdivided some land in sections 17, 18 and 19 of township 23, range 12, and sections 24, 25 and 26 of range 13.

The land in these sections adapted to agriculture is very limited. The mountain slopes in general are too steep to permit of farming operations. Occasionally small benches of good land were encountered, and these, with the somewhat narrow strip of land between the edge of the water and the foot of the mountain, provide the only land where farming can be carried on. I do not think that much activity in farming will characterize this locality. Good grazing land, however, is found on all sides, and cattle raising might flourish if sufficient hay land can be located to provide winter feed.

Fish are plentiful in Adams lake, and game, including bears, deer and lynx is to be found on the mountainsides.

Climatic conditions are favourable to agriculture. Summer frosts do occur, but are not generally of a very severe character.

Irrigation will probably be necessary, but ample water can be found in almost all localities where it is required.

From Adams lake, we moved to the northerly end of Niskonlith lake in township 21, range 13, west of the 6th meridian.

In the immediate vicinity of Niskonlith lake, namely, in sections 6, 7, 17 and 20 we found very little good land, except in sections 6 and 7 where there is a limited area of agricultural land.

The timber in this locality consists almost entirely of bull pine and fir, from 1 to 2 feet in diameter, with, in sections 6 and 7, some poplar and willow. The land in sections 17 and 20 and portions of 6 and 7 lies on a somewhat steep slope, which, however, provides excellent bunch-grass. In the east halves of the southwest quarter of section 7, and the northwest quarter of section 6, some first-class agricultural land was found, but only to a limited extent. Irrigation, too, is necessary, and the source of water supply for it is not evident.

North of the lake, however, along the valley of Loakin creek we found a considerable area of first-class farming land.

Our work this season, north of the lake, included surveys in sections 29, 32 and 33 of township 21, range 13, and sections 4 and 9 of township 22 range 13, but if time had permitted these surveys could have been extended into sections 16, 21, 22 and 15 where excellent farming land exists.

Loakin creek appears to have its source in a chain of small lakes, lying about the

southwest corner of section 22. If on the removal of the bush, irrigation is found necessary, ample water could be obtained from these lakes and creek.

This land is elevated from 500 to 800 feet above Shuswap lake. The soil in the bottom lands along the creek consists of a rich black loam, with a sand or gravel subsoil, while farther back on the side slopes and benches the soil is a light loam, sometimes sandy with a gravelly clay or gravel subsoil.

This country is also covered with bush, fir, cedar, hemlock, pine, birch and spruce being the prevailing woods. Some fairly good patches of merchantable timber were found on the bottom lands along the creek. This consisted chiefly of cedar. In the northwest quarter of section 4, and the southwest quarter of 9, some fine fir, spruce and cedar were found from 12 to 30 inches in diameter, so that clearing the land, while necessarily a slow process, will not present any special difficulty.

The climatic conditions render this an ideal farming and fruit-raising district. Summer frosts are not severe enough to damage the crops, while in winter the district is favoured with a sufficiently heavy snowfall to protect young orchards.

Agriculture has been carried on for a number of years on the northeast quarter of section 20, township 21, range 13. Here gratifying success has been attained in strawberry culture, and a few apple, plum and cherry trees, probably about ten years old, produced excellent fruit this season, notwithstanding the fact that their condition shows neglect. If under the condition in which these few trees were found they can at least retain life, let alone bear fruit, no doubt under proper handling this locality will be found to be a profitable fruit country. Except this farm, no attempt at agriculture has as yet been made in this locality.

MABEL LAKE.

Our next work led us into Mabel Lake country in townships 19 and 20, range 5, west of the 6th meridian, where, in addition to the traverse of that portion of the lake lying within the Railway Belt, we planted posts along the lake convenient to suitable agricultural land, and subdivided portions of sections 26 and 27 of township 20, range 5.

This, from a settlement standpoint, is a new country. Lying adjacent to the Okanagan valley, 25 miles east of Enderby it is favoured with an ideal climate. Frosts are unknown in this district from May until November, and the rainfall seems to be sufficient to render irrigation unnecessary. If, however, experience proves the contrary, sufficient water is easily available in every locality where farming can become established.

By far the largest areas of land adapted to agriculture lie in the Frog and Noisy Creek valleys.

Extending up Frog creek from its mouth in section 27, a distance roughly estimated at from 6 to 8 miles northeasterly, there lies a valley with an average width of about 1 mile admirably adapted to mixed or fruit farming.

The soil of the bottom lands immediately along the creek is of a rich black loam, while that on either side is of a brownish loam with a sand or gravel subsoil.

The land is very heavily timbered with cedar from 3 to 10 feet in diameter, resembling very much the country on the lower Columbia river below Revelstoke. The cedar from 3 to 5 feet in diameter is generally sound, and easily handled by driving it down Frog creek and rafting it through Mabel lake to Shuswap river, down which it is taken to the mills at Enderby.

Considerable difficulty was experienced in making the surveys in this locality, owing to the fact that the beaver have dammed the country along the valley, flooding it for miles up Frog creek. Wading these meadows or rather lakes, in November, is work to which the axemen do not take kindly, and it was found advisable after having subdivided a few quarter sections, to abandon the work for this season.

At Noisy creek no subdivision surveys were made, but examination showed that a considerable area of good land lies in the neighbourhood of sections 17 and 20.

Some good bench land is also to be found in section 30 of township 19, range 5. Deer, bears and caribou are very plentiful in this district. Beaver are very numerous, and marten and mink are also to be found.

A fairly good wagon road leads from Enderby to Mabel lake, while the lake permits of navigation throughout its entire length. Along this road the intending settler has convincing proof in the flourishing fruit orchards and farms of what can be done in the locality. No portion of British Columbia can boast of better produce. Conditions here should lead to the early settlement of this land.

This completed our fruit land surveys, and from here we went to Ashcroft and thence up the Cariboo road, where several small surveys occupied us for the remainder of the season.

SHUSWAP LAKE; COLUMBIA RIVER AT GOLDEN.

Report by W. J. Deans, season 1910.

SHUSWAP LAKE.

I arrived at Notch hill on May 3, 1910, whence I proceeded to township 22, range 10, west of the sixth meridian.

My first work consisted of the surveying of part of this township into half legal subdivisions. These lands extend to the shore of Blind bay on Shuswap lake and vary in height from a few feet to 1,300 feet above the lake. Most of the land in the area subdivided is classed as bench land, though in some places there are quite large level tracts, and in other places the land is broken by ridges and ravines. The soil generally on the flat land is clay, while on the broken land it is a clay mixed with sand and gravel. The whole surface, except where burnt over by fire, is covered with a thick growth of small poplar, birch and willow, with occasional clumps of fir which have been left by the lumbermen owing to the difficulties of getting the logs out. There are four small lakes containing good water. As all or most of the land surveyed by me was in a timber berth, there are numerous lumber roads and trails throughout the whole tract. There is, also, a good road from Notch Hill station, running through the township. These roads and trails make travelling easy and the market for produce can at all seasons be reached without difficulty. I am told by the settlers that the heavy clay land will not produce satisfactory crops until it has been sown with white clover; this seems to restore to the soil all the elements necessary for successful production. I saw a few small apple orchards, which had been planted on this clay soil prepared first by sowing clover, and, although the trees had only been set out two years, they were in a very healthy condition and gave promise of development into a producing orchard. I saw a five-acre apple orchard at Notch Hill station, the trees of which consisted of well-known winter varieties, and had been set out two years. The owner bought the land at fifty dollars an acre. He was well pleased with his venture, and felt sure that the climate and soil were well suited to apple production. The land is similar to the lands I subdivided, and I have no doubt that most of the land surveyed in this township is well adapted to the cultivation of apples, cherries and berries.

These lands are also well adapted to the production of garden vegetables. I saw many small gardens, and although the land did not seem to be in a high state of cultivation, yet the vegetables would be hard to excel.

Timothy yields well on the lower levels, and heavy crops of oats are grown.

The rainfall during May, June and part of July was sufficient for agricultural purposes, and although we had frosts in May and June, yet they were not severe enough to do any damage to grain or vegetables.

There are many ideal camping places in this township along the shores of Shuswap lake. A beach of sand and gravel extends fifty feet back from the water, and from there the land rises in a gradual slope. The ground is carpeted with a

thick growth of grass and creeping vines and is wooded with large fir and cedar. Bears and deer are to be found in the forest, while the lake abounds in fish. Plenty of pure water is to be found in the numerous mountain streams. My last work in the township, which was finished on July 12, was near White lake. The land near the lake is covered with a heavy growth of fir and cedar, some of them thirty-six inches in diameter. Fire has done some damage around the lake and the fallen timber makes it difficult to travel.

On July 13, I hired a gasoline launch and moved the outfit to township 24, range 8, west of the sixth meridian. This township is situated on the shores of Seymour Arm, a part of Shuswap lake. On July 15, I started to run the north boundaries of sections 3, 2 and 1, which form part of a reservation to the south. This line extends from the lake shore up the side of a steep mountain and attains a height of 2,200 feet above the lake. Then there is a flat of some twenty chains and then the line descends to the west shore of Anstey Arm. The surface of the mountain on the west side near the lake is covered with fir, poplar and cedar from ten to twelve inches in diameter, while farther up the mountain the trees are small and scattered, with clumps of poplar and hemlock scrub. On the top of the mountain, the timber consists of fir, hemlock and birch, from eight to ten inches in diameter, with hemlock scrub. On the east slope of the mountain the timber is generally small, except in a few places where the fir and hemlock attain a diameter of from twelve to sixteen inches.

The soil along the north boundary of this reservation consists of sand and stones, with patches of rock. There are a few places where the soil is clay, but the area is very small. I do not consider the lands adjoining the north boundary of this reservation on either side of any value for agricultural purposes.

On July 19, we moved the outfit up Seymour Arm to the north boundary of section 15. My work here consisted in subdividing a strip of land lying between the north boundaries of sections 15 and 35 and extending back from the lake shore for a distance of about a mile and a half. The shore of the lake had been traversed and monuments erected at section corners. Generally speaking, the whole of this tract rises very abruptly from the lake to a height of 400 feet, then in short benches until a height of from 1,200 to 1,600 feet is attained at a distance of a mile from the lake shore. There is a large portion of this tract which in my opinion is suitable for the cultivation of apples, cherries and berries. Wild berries grow in great abundance, attain a great size and have a splendid flavour. The soil in this part is mostly clay, gravel and sand, with large patches of bare rock in many places. The surface near the lake is covered with fir, poplar, birch and cedar, from six to twenty-four inches in diameter. Most of the large fir which we cut down were rotten at the heart, while the cedar were only shells. The surface a mile back from the lake is largely covered with a thick growth of small hemlock with occasional clumps of fir. The soil where these small hemlock grow consists of loose rock, covered with moss and an inch or two of soil. I did not subdivide the east half of section 23 nor the west half of section 25, township 24, range 8. I do not think that these lands are of any use for agricultural purposes. The soil is largely composed of loose rock and moss on which there is a thick growth of small hemlock scrub.

I completed the subdivision of that portion of township 24, range 8, lying along Seymour Arm, and on August 23, moved the outfit by gasoline launch to Anstey Arm, camping on section 12. I subdivided the northeast quarter of section 12 and the east half of section 13, thus completing all the subdivisions which I had to make in township 24, range 8. The land in sections 12 and 13 slopes gradually up from the lake to a height of 400 to 800 feet. The surface is covered with a thick growth of poplar, fir and cedar, from three to six inches in diameter; there are numerous ravines in section 12, which cut the land up badly, and the soil is clay with gravel and loose rock covered with moss along the north side of the section.

The east half of section 13 contains some good land which slopes toward Anstey Arm; the soil is clay and sand with gravel and patches of rock in places, and the surface is covered with a thick growth of small spruce and birch, with thick underbrush. To clear this land would entail a good deal of hard work, but it would amply repay the settler when under cultivation. I subdivided section 18 and part of 19 in township 24, range 7. These sections slope sharply towards Anstey Arm and are covered with a thick growth of bush, with scattered fir, cedar, poplar and birch, eight to ten inches in diameter. The soil is clay and gravel with patches of rock.

On September 9, I moved the outfit with two small rowboats across Anstey Arm to section 8. My work in this locality was to subdivide the land lying along the shore of the arm between the north boundary of section 7, and the south boundaries of sections 5 and 6. I completed the subdivision of this tract on September 21, and moved camp to section 35, township 24, range 7. The work in the township was finished on October 15. Most of the land which I subdivided along Seymour and Anstey Arms is well adapted to apple and berry production. The soil is suitable, the rainfall sufficient, and I think there are no severe summer frosts. The land is accessible by boat, the greater part of the year. Sicamous Junction, a station on the Canadian Pacific railway, is within eighteen miles, and from this point a number of steamboats and gasoline launches make trips to different parts of the lake. Farm produce and vegetables are very high in price, the local demand at all times being much in excess of the supply.

COLUMBIA RIVER, GOLDEN.

On October 15, I moved into Sicamous on my way to the Columbia river valley. I arrived in Golden on October 16, whence I moved the outfit by team to section 3, township 26, range 21, west of the fifth meridian.

Golden, situated on the main line of the Canadian Pacific railway near the junction of the Kicking Horse and Columbia rivers, contains about 800 inhabitants. It is an important railway point, and it is also the headquarters of a large lumbering company. There are a number of churches in Golden and also a good school. The town is lighted by electricity and has an efficient fire brigade. The lands in the vicinity are fertile and when settled and cultivated Golden will become a thriving centre. There is a steamboat which sails from Golden to the head waters of the Columbia river and does a large trade in passengers and freight. There is also a good wagon road, running south in the Columbia river valley to Fort Steele. The Kootenay Central railway have a portion of their road constructed.

My work in the Columbia river valley was to survey three timber berths and subdivide agricultural lands in townships 25 and 26, range 21, west of the fifth meridian. I had a great deal of trouble and hard work to get my outfit up to the northeast corner of section 4, as this point is about 800 feet above the Kootenay road. I surveyed timber berth No. 542 from this camp, and ran all lines within a reasonable distance. On November 17 I divided my outfit, leaving half camped on section 26, township 25, range 21, while the other half went up to survey timber berth No. 541 and camped near the east boundary of section 36, and as this land is fairly good for agricultural purposes I laid it out in legal subdivisions. The timber will probably be cut off inside of two years, when the land will be available for settlement. The Columbia River Lumber company have about sixty men working on timber limit No. 421 and expect to cut not less than 3,000,000 feet. The same company have also a camp on section 10, township 26, range 21, and expect to cut 2,000,000 feet. On both these limits they are cutting some fine timber, principally fir and spruce. These camps furnish employment for a large number of men in winter. Few of the settlers appear to take advantage of this opportunity to get employment, as nearly all the men are from outside points, and when the camps break up in the spring, they seek new fields of employment. I did not subdivide the northwest quarter of section 26,

as this land is subject to flood and is at the present time largely covered with water, the only portion dry being a small fringe along the banks of Columbia river. I had considerable difficulty in surveying timber berth No. 543 on account of the river not being frozen very hard, it being necessary for us to cross and recross it a number of times. This timber berth lies on the west side of Columbia river and consists of fractional southwest quarter of section 26, township 25, range 21. The berth is level, except at the southwest corner, where it rises to a height of about 300 feet. The soil is clay and sand, and will produce hay, grain, vegetables and fruit. There is an extensive strip of flat land on both sides of Columbia river, but owing to the river overflowing its banks, this land is covered with water the greater part of the year, and, therefore, not of much value even for grazing purposes. To make this land available for settlement involves engineering difficulties, the solution of which is of the greatest importance to the settlers. Owing to the depth of snow on the benches and the stormy weather, I was unable to complete all of the work in townships 25 and 26, range 21, for which I had instructions.

Before discontinuing the work I ran the north and east boundaries of section 30, township 26, range 21.

The settlement in the Columbia river valley is confined to a narrow strip along the Kootenay road, so that between the settled lands and the mountains there is quite an extensive bench of agricultural land. These bench lands are from 100 to 1,000 feet above Columbia river and contain many small tracts of level land. The soil is clay, sand and gravel, with patches of rock, and the surface is covered with fir, spruce, poplar and birch. In most places the merchantable timber has been cut off, yet in many places there are quite large clumps of fir twelve to eighteen inches in diameter which were too scattered for lumbermen to log economically. There are numerous trails and roads through these lands, made by the lumbermen, and in some places the land could be cleared with little labour.

This part of British Columbia has many inducements to offer the settler. The summers are delightful, being warm in the daytime and cool at night, while the winters are mild. Good prices can be obtained for all kinds of farm produce. The soil is fertile, and there is plenty of timber for building purposes and fuel. An abundant supply of pure water suitable for all domestic purposes can be easily obtained. Roads are good, while schools and churches are within reach of all. Plenty of wild game is found in the forest and fish in the rivers and streams.

The weather for the greater part of the season was favourable for field work. We had two weeks of rainy weather in October, and some rainy and stormy weather in November and December.

I discontinued the work on December 15, and on the same day moved into Golden, paid the men off, and on December 19 arrived back in Brandon.

SHUSWAP LAKE DISTRICT.

Report by D. A. Smith, D.L.S., season 1910.

We left Kamloops on May 29, 1910, and reached our first work which was in township 25, range 8, west of the sixth meridian, on the 31st.

The land surveyed in this district all lies within a few miles of Shuswap lake and is easily reached by boat from Sicamous. Launches and steamers run on Shuswap lake and will land passengers or freight wherever desired. Violent and sudden storms, however, render travelling by small craft dangerous.

Hunakwa lake is reached by portage from the head of Anstey Arm. The portage is about a mile long with good firm ground and very little climbing. In high water a small boat may be taken up Hunakwa creek, but during the time of survey, June, there was not enough water to float an empty canoe.

The survey was commenced from the northeast corner of section 27, township 25, range 8, a point established by Mr. J. E. Ross, D.L.S., and was carried by triangulation across to the east side of Seymour Arm, where all the work lay. From Seymour Arm the survey was carried as far east as was expedient and the remainder of the work in that district was completed from Anstey Arm and Hunakwa lake.

During the early part of the work and from the latter part of September to the middle of November, when we left Shuswap lake, there was scarcely a day without rain and frequently the rain lasted all day. The thick underbrush was always wet so that it was almost as disagreeable on a fine day as on a rainy one. During July, August and the early part of September, the weather was exceptionally good. Considerable time was necessarily lost in going to and from work, since much of the land surveyed lay at some distance from the shore, and owing to the rugged nature of the country it was a slow and difficult undertaking to pack a camp outfit to a convenient place.

The land rises generally from the shore of Shuswap lake from two to eight hundred feet, with steep rocky slopes of which very little is suited for agriculture. Back of this there is generally a gently rolling bench or series of benches extending to the foot of the mountains. At the north end of Anstey Arm is a level tract of land about a mile in width extending to Hunakwa lake; this lake is about three miles long and half a mile wide. There are numerous small creeks, Anstey creek being the largest. During high water it may be used for bringing down logs, and from its rapids and falls considerable power might be developed.

By far the most valuable of the resources is the lumber, though much of this part has been swept by fires in recent years. Most of the valuable timber has already been disposed of, and, outside of the timber berths, the good timber is scattered and difficult to get out. No minerals of value have been discovered, but the country has not been thoroughly prospected. Fish are plentiful, but they are more of a sporting than a financial asset. Game is scarce, a bear, a deer, and a few grouse being all that were seen in the district, though signs of bears and deer were frequently noticed.

So far no attempts at cultivation have been made with the exception of small gardens, indifferently cared for, but the results, considering the work done, were promising. A few miles to the north, the common varieties of garden produce have been tried with excellent results. At the head of Seymour Arm a large tract of land is being planted with fruit trees, but what success will attend this industry remains to be seen. Early frosts, especially on the higher levels, is the greatest danger that threatens them. Irrigation is not considered necessary, and, judging from the past season, the rainfall is sufficient for all purposes. Small wild fruit grows abundantly wherever a chance is afforded, and there is no doubt that all small fruits would yield well. The swamp land can be drained and used for grain, hay and garden produce.

The quality of the land is very variable. There is a great deal of land in the territory surveyed that is useless from an agricultural standpoint largely on account of the rock and steep slopes, but it was necessary to survey it to take in what was good. The prevailing soil is a sandy loam with a gravel or gravelly loam subsoil. The swamps are generally of rich black loam, at present wet but easily drained.

On the completion of the work in the Shuswap district I moved to township 25, range 20, west of the fifth meridian, about fifteen miles southeast from Golden. This part is easily reached by a wagon road following up the Columbia valley from Golden to Fort Steele. The Kootenay Central railway is graded out about fifteen miles from Golden but only about a mile of track has been laid yet.

During the time we were working in this district, the trees were heavily laden with snow. This, with from one to two feet of snow on the ground, made fair progress impossible. Most of the work lay on the bench land where there is a thick

growth of trees, the more open land in the bottom having been previously surveyed. The snow in the bottom was about six or seven inches deep.

The land rises from the river-flat with a very gentle slope which extends back varying distances to the foot of the steep slope leading to the upper bench land. Most of this lower land is good and has already been taken up. The upper bench extends in a gentle slope or a series of benches to the steep, rocky sides of the mountains. The steep slope leading from the lower to the upper bench land is useless for agricultural purposes. So far as soil is concerned much of the upper land is good. It is generally clay loam, sometimes with sandy or gravelly subsoil, and is suitable for grain or fruit.

In this township there is some good timber, chiefly fir, but here as in the Shuswap district the best has been disposed of and what remains is very difficult to get out. No mineral discoveries have been made, at least no mines are at present being worked.

The township is intersected by numerous small creeks some of which are being used to irrigate the lower land and small areas of the upper land. Irrigation will have to depend almost entirely on the rainfall, which I believe is not sufficient for requirements.

In the settled parts, a number of apple trees have been planted, but have not given satisfactory results, many of them having died. The apples that I saw, which were grown in the district, were small but of good quality. It is doubtful if the upper benches will be suitable for fruit owing to the early frosts. Small fruits of all kinds give very large returns and are easily grown. From experience it would seem that on these, rather than on apples, the settlers will have to depend. Alfalfa has been grown and yields well.

Game is scarce, nothing but grouse being seen, though brown bears and grizzlies, deer, sheep and goats are reported to be fairly plentiful on the higher lands. Nearly all fur-bearing animals are becoming scarce in the railway belt.

MABEL LAKE, SHUSWAP RIVER, DEEP CREEK, GOLD RIVER, BUSH LAKE, COLUMBIA RIVER, NEAR GOLDEN.

Report by N. C. Stewart, D.L.S., 1912.

SIR,—I have the honour to submit the following report of my season's operations in the railway belt of the province of British Columbia.

I left Enderby on May 14, 1912, for my first work in township 18, range 7, west of the sixth meridian. The wagon road between Enderby and Mabel lake runs through this township. This road has been widened out and graded during the past season, and is now in good shape, but the soil through which it passes is a heavy clay, which makes it very muddy and sticky after a rain. Owing to the numerous logging operations carried on in this vicinity and on Mabel lake, and to the large number of settlers along Shuswap river, this road is very much used. A branch road, built by the settlers, which leaves the main road about seven miles from Enderby, enabled me to bring my supplies to section 30 with wagons.

I completed the surveys of four sections in the northwest part of the township. A few small benches of good land were found, and the hillsides were covered with grass, making them good for grazing purposes. The soil is a light sandy loam, with a gravel and drift-rock subsoil. The timber has been nearly all burnt off, but a few large fir and bull pine remain. The upper benches in this valley have been cultivated very little, but some good results have been obtained, especially in the raising of vegetables, hay, grain and small fruits. The climate during May and June was all that could be desired, warm days with cool nights but no frost, and only a few days of rain.

I ran two miles of line on the east boundaries of sections 6 and 7 in township 19, range 7, but found only rugged and worthless mountain tops, from which the timber had all been burnt.

On June 4, I moved across Shuswap river to the northwest quarter of section 23, township 18, range 8. A branch road was being built from the Mabel lake road to Trinity valley, a bridge having been erected over Shuswap river on the east boundary of section 22. This road was completed in the fall. The soil along the river is a rich clay loam, which produces hay, grain, vegetables and fruits in abundance. On the benches along Trinity creek a light sandy loam with a gravel subsoil was found. No one has tried to cultivate these benches up to date. The country west of Trinity creek is covered by some marketable timber, but to the east of this creek a bush fire occurred during the previous summer which destroyed most of the timber. Trinity creek has several high waterfalls which might be used for power sites, if the water supply was sufficient in the dry season. More rain falls along Trinity creek than on the north side of Shuswap river.

Game is plentiful in this neighbourhood; black bears, deer and blue and willow grouse were frequently seen.

On June 15 we took the train at Enderby for Field, where we camped in one of the most picturesque spots in the Rockies, on the northern slope of Cathedral mountain, and in direct line with the famous Yoho valley. My work here consisted chiefly in retracements and making ties to the Canadian Pacific railway survey.

The only industry in this part is mining. The Monarch mine is situated on Mt. Stephen, in a very romantic locality. About twenty men were employed, and the mine was said to be paying dividends. The ore is silver-lead.

The old grade of the Canadian Pacific railway has been made into a wagon road, thus affording a means of travel from Field to Hector, and a good road has been constructed from Field up the Yoho valley for the use of tourists. We had excellent weather during our two weeks' stay. We returned to Moberly on July 1 and commenced regular subdivision work in township 28, range 22, west of the fifth meridian. The soil in this township is a sandy loam, with a clay loam subsoil in many places, which should produce hay, grain, small fruits and vegetables. The land of a similar nature which has been cultivated around Golden produces good crops. A hill between 200 and 300 feet high is found along Columbia river; back of this hill is a more or less rolling bench land which varies from about a mile in width at the south boundary of the township to over five miles at the north. East of this bench rise the rugged slopes of Moberly peak and the mountains to the north of it. Practically all the trees have been burnt, and a thick second growth covers the fallen timber, making travelling and clearing difficult. A road has been built from Golden to Blaeberry river, a distance of nine miles, and a branch road was built by the squatters from Moberly to section 11. A trail from Moberly up Blaeberry river is utilized by the trappers and settlers along that stream. The farmers along Columbia river are very prosperous, mixed farming being found to be the most suitable for this region. The meadows along Columbia river afford a supply of hay for feeding the stock during the long winter. Quite a few trappers still operate in this district, and large game such as bears (black and grizzly), moose, deer, caribou, goats, coyotes and cougar are plentiful; rabbits, grouse and ducks are fairly numerous. Good fishing is to be had at places along Columbia river, especially at the mouths of the clear-water streams from the Selkirks. Much rainy weather was encountered during July and August. A large forest fire occurred in this township and those to the northwest in June, and another large fire destroyed much valuable timber south of Golden. I completed the survey of all land suitable for agriculture in this township east of Columbia river on August 10.

Leaving Beaver mouth on August 12, in three heavily loaded canoes, we drifted down to the mouth of Gold river in township 32, range 26, west of the fifth meridian,

in about six hours. At the mouth of this river a large flat was found composed of large marshes from which hay could be cut and which were subject to overflow from Columbia and Gold rivers. Around the marshes, large timber, chiefly spruce, was found. Gold river has its source in some of the highest and most picturesque peaks of the Selkirk range, and the melting of the numerous glaciers in these mountains on a hot day causes the water to rise at the rate of about a foot an hour, and the cool nights following cause it to subside almost as rapidly.

On August 28, we moved camp to Bush lake by going up Bush river to the creek and thence to the lake. Here we completed two miles of the belt limit. The country around this lake is all heavily timbered. The land in this township is not very suitable for agricultural purposes, but the wild hay will be valuable when logging operations commence on the numerous timber berths in this territory. The proximity of the glaciers has a bad effect on the climate, and we had very wet weather during our stay on the lake.

Bush lake is at present an ideal spot for a sportsman. There were hundreds of ducks and geese there and its waters were full of rainbow trout. Fur-bearing animals such as beaver, mink, marten, and skunks are plentiful. Two black bears were seen, and the tracks of numerous caribou and goats are to be found on the mountains. Combining this with the fine scenery, the unsurpassed mountains and the ease of canoe travel, I believe one could not find a better place for an outing.

We left Bush lake on September 6, and proceeded up Columbia river to section 17, township 31, range 25, west of the fifth meridian. At two large bends in the river there, I found some land which is suitable for agricultural purposes, although the area of this land is not very great. The soil is a sandy loam with a clay loam subsoil. I examined part of this township to the northeast of Columbia river and though I found no more land suitable for farming, I did find some excellent timber consisting of large fir, pine, cedar, spruce and balsam. Numerous grouse and ducks were seen, and I might also mention the presence of mosquitoes.

On September 11, with one canoe, I left for Beavermouth, Mr. Johnston following next day with the crew and outfit. We left that place and arrived in Rogers Pass on the 13th.

The survey of the townsite of Rogers Pass was completed on September 21, after which we returned to the Enderby district to complete the surveys there before the snow came. Our work in township 17, range 10, west of the sixth meridian, was reached by wagon from Armstrong. This work was chiefly retracement. The productiveness of the soil in this neighbourhood is shown by the prosperity of the farmers who all have good homes, large barns, fine horses, cattle, sheep, etc. The orchards produce more fruit than can be taken care of, and many acres of potatoes have been left until spring for harvesting owing to an over supply. The growing of celery is becoming a specialty with some of the farmers.

From this township we proceeded by wagon to Deep creek valley where we found a very prosperous community engaged in mixed farming. The land subdivided in township 19, range 9, is all on the west side of the valley. The country had all been burnt over several years ago and a very dense second growth has sprung up. The soil in the bottom lands is a clay loam and on the benches and side-hills it is a sandy loam with numerous rock outcrops. The settlers are very optimistic about the productiveness of the soil in this valley. As the altitude is considerably higher than at Armstrong very little fruit growing has been attempted; however, it has been shown that the hardier fruits can be grown. Snow fell on October 19, and all the month was very wet. Willow grouse were very plentiful.

On October 24, I again moved to township 18, range 8, and surveyed the north boundary of section 14, after which we went to township 20, range 8, where we made surveys in sections 15 and 22. A few small benches of fairly good land were found,

the soil being of a light sandy loam suitable for growing fruit and vegetables. The fruit farmers in this district are very prosperous.

The towns of Enderby, Armstrong and Salmon Arm are in a flourishing state owing chiefly to the farming and lumbering industries. The prospect of the coming of the Canadian Northern railway into Armstrong has enlivened that town considerably, and the completion of the road will no doubt advance the prosperity of the settlers since it will give them another outlet for their produce. The lack of sufficient transportation is at present the principal drawback to this neighbourhood.

We moved again to the vicinity of Golden to traverse part of Columbia river in townships 28 and 29, range 23, west of the fifth meridian. This work was made very easy by the low water. In these townships the Columbia is broken into numerous channels, and the islands are all timbered with spruce, jackpine, balsam and cypress. The large timber was logged off several years ago. The soil on the islands is a sandy loam with a clay loam subsoil and therefore should be suitable for agricultural purposes. I also surveyed some of the bench land in township 29, range 22, and township 29, range 23. This bench is a continuation of the bench land of township 28, range 22, and extends from Blaeberry river to Waitabit creek, a distance of about six miles, and averages about one and a half miles in width. The soil is a light sandy loam with a gravel subsoil and should produce good results when cultivated. The timber has all been killed by fire, the most recent fire having been started last spring. Numerous settlers are trying to locate on this land, which shows that it appears suitable for farming.

On December 4, I decided to disband the party on account of the depth of the snow and the dangerous condition of the river for canoeing.

DESCRIPTION OF TOWNSHIPS.

Tp. 23, R. 18, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 14, NW. $\frac{1}{4}$.—Rough bench land rising from the Columbia river to 500 feet above; red clay loam, very stony; poplar, willow and jackpine with scattered large fir; would make pasture land.

SW. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section, mostly bottom land rising from the Columbia river to 100 feet above; red loam with much gravel in places; poplar, willow, birch, spruce and fir; good agricultural land, especially near the river.

SEC. 21, NE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section, bottom land rising from the Columbia river to 50 feet above; red clay loam with some gravel and a great deal of lime in some places; small poplar, birch and willow; good agricultural land.

SEC. 22, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land rising to 800 feet above the valley; red clay loam, very stony in places; poplar and jackpine with scattered large fir; of no agricultural value; the land is very dry, and there is only one small stream flowing through the section.

SW. $\frac{1}{4}$.—Bottom land rising to bench land 350 feet above the river; bench land very rough and stony, bottom land rising to 100 feet above the Columbia river; red clay loam, very stony; poplar and spruce with much fir up to 10 inches diameter; poor agricultural land.

SEC. 23, SW. $\frac{1}{4}$.—Bench land 400 to 800 feet above the river; red clay loam; poplar, willow, spruce with some fir up to 18 inches diameter; of no value except for pasture; $\frac{1}{4}$ section is very badly broken along the west side, and is very dry.

SEC. 28, NW. $\frac{1}{4}$.—Rough high land rising steeply from the river; red loam, very stony; poplar, birch, jackpine and fir; of no agricultural value unless for pasture.

SE. $\frac{1}{4}$.—West half is taken, the remainder is very rough, broken high land rising from the bottom land; red sandy clay loam; jackpine and small fir with scattered large jackpine; of no use except for pasture.

SEC. 32, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section, bottom land rising to very rough high land; bottom land rising to 75 feet above the Columbia river, a narrow strip by edge of sloughs; red loam; poplar, spruce and fir; very good agricultural land; high land would make pasture land.

Tp. 24, R. 18, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 1, NW. $\frac{1}{4}$.—Bottom land rising to 120 feet above the Columbia river; fractional $\frac{1}{4}$ section; loam with some gravel; small poplar, birch, fir and jackpine; good agricultural land.

NE. $\frac{1}{4}$.—Bottom land rising to bench land 375 feet above the Columbia river; bench land rough and stony, with scattered large fir up to 1 ft. diameter; land of very little value; bottom land rising from the Columbia river to 100 feet above; red loam; poplar, willow and small fir; good agricultural land; the southwest part of $\frac{1}{4}$ section is cut off by sloughs.

SEC. 6, NW. $\frac{1}{4}$.—Bottom land rising to bench land, 100 feet to 400 feet above the Columbia river; red sandy loam with much stone; poplar, willow, jackpine and small fir; some good agricultural land on the benches (with scattered large fir).

SW. $\frac{1}{4}$.—Bottom land rising to 150 feet above the river; black loam covered with gravel; overgrown with poplar and willow brush; some good land near the river, but most of $\frac{1}{4}$ section is too stony to be of much value.

SE. $\frac{1}{4}$.—Bottom land rising to high land; high land very steep and of no agricultural value; bottom land rising from the Columbia river to 100 feet above; black loam with much gravel; overgrown with poplar and willow. There is a small area of good land close to the river.

SEC. 7, SW. $\frac{1}{4}$.—Rolling bench land 300 to 700 feet above the valley; red clay loam with a good deal of stone; poplar, willow, small fir and jackpine, with scattered large fir; some good agricultural land.

SE $\frac{1}{4}$.—Bench land rising to high land; very rough and stony; willow, poplar and jackpine; of no agricultural value unless a small area along the west side.

Tps. 23 and 24, R. 18, W. 5th Mer. *C. H. Taggart, D.L.S., 1911.*

These townships are reached from the town of Golden, on the main line of the Canadian Pacific railway, by a splendid wagon road which traverses the valley, following the right bank of the Columbia river. It may also be reached by steamers which ply up and down the Columbia river during the navigation season. Within a year it is expected that the Kootenay Central branch of the Canadian Pacific railway will be in operation between Golden and Spillimacheen. In all the sections surveyed, patches of good bench lands can be found. The soil on these benches is chiefly sandy or clay loam, and is suitable for almost any crops of vegetables and small fruits. Fruit growing on the benches is yet experimental, that is, as far as the larger varieties are concerned. These benches are mostly covered with jack pine, poplar and small fir and spruce of no commercial value. In some cases these lands are comprised within timber berths, on which the timber has been cut. Irrigation may become necessary to obtain the best results on these lands, but the supply of water from the numerous mountain streams flowing into the Columbia river will be ample. Of the lands on the left side of the river the same cannot be said. Here it is claimed that irrigation is necessary for results, and the supply of water is very limited, as there are few streams flowing on this side. Fuel is plentiful everywhere in the valley. No summer frosts occur. No minerals, water-powers nor stone-quarries exist. Deer, mountain goats and grouse are to be found in close proximity to these lands.

Tp. 23, R. 19, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 23, NE $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land about 800 feet above the Columbia river; red clay loam; poplar and jackpine with scattered fir; would make good agricultural land if not too dry; there are some small ponds and meadows, but no running water, and the land could not be irrigated.

Tp. 24, R. 19, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 4, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land about 800 feet above the Columbia river; red clay loam; poplar and jackpine with scattered fir; would make good agricultural land if not too dry; there are some small ponds and meadows, but no running water, and the land could not be irrigated.

SEC. 10, NE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section, bottom land rising to bench land 400 feet above the Columbia river; soil, red clay loam, stony on hillsides; poplar, willow and birch; there is a small area of good land along the bank of the slough.

SEC. 11, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Bottom land and bench land; bench land rises to 600 feet above the Columbia river; red clay loam; poplar, willow and scattered large fir; bottom land rises to 100 feet above the river and covers a small area in southwest corner of northeast $\frac{1}{4}$ and southeast corner of northwest $\frac{1}{4}$; it is very stony and of very little agricultural value.

SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ sections. Bottom land rising gently from the Columbia river to 100 feet above; black loam with much gravel and stone; poplar, birch and willow; poor agricultural land.

SEC. 12, NW. $\frac{1}{4}$.—Rolling bench land 350 to 700 feet above the Columbia river; red clay loam; small poplar, fir and jackpine, with scattered large fir; most of $\frac{1}{4}$ section would make good agricultural land.

SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land rising to 720 feet above the Columbia river; red, sandy loam, much of it very stony; small poplar, willow, jackpine and fir, with scattered large fir along hillsides; would make pasture land.

NE. $\frac{1}{4}$.—Rough bench land rising to high land, 750 feet above the Columbia river and up; red sandy loam, much of it very stony; poplar, willow and jackpine; land is of no agricultural value.

SEC. 13, SW. $\frac{1}{4}$.—Bench land rising to high land 600 feet and upwards above the Columbia river; red clay loam, stony in places; poplar, willow and jackpine with scattered large fir; some good agricultural land on west side.

SEC. 14, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Bench land rising to high land, 600 feet above the Columbia river and up; red clay loam, very stony in many places; poplar, birch, willow and jackpine; of no agricultural value.

SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 400 to 900 feet above the Columbia river; red clay loam, stony in places; poplar, willow and jackpine, with scattered fir; SE. $\frac{1}{4}$ section is rough, would make pasture land; SW. $\frac{1}{4}$ is not rough, good agricultural land.

SEC. 15, NW. $\frac{1}{4}$.—Bench land 300 to 700 feet above the Columbia river; red clay loam, stony in places; poplar, willow and jackpine, with much good fir to north; very rough, and of no agricultural value.

SW. $\frac{1}{4}$.—Bottom land rising to bench land 350 feet above the Columbia river; bottom land rises to 100 feet above the river; red clay loam, rather stony in places; poplar, birch and willow; good agricultural land, especially near the river.

NE. $\frac{1}{4}$.—Bench land rising to high land; red clay loam, very stony to the north and east; poplar, willow, jackpine and spruce with scattered large fir; some benches would make good agricultural land.

SE. $\frac{1}{4}$.—Bench land rising from the Columbia river to 600 feet above; red clay loam; jackpine, poplar and willow with a few scattered large fir; there are some good agricultural benches, but most of $\frac{1}{4}$ section is badly broken.

SEC. 16, NE. $\frac{1}{4}$.—Bottom land rising to bench land, 500 feet above the Columbia river; red clay loam, very stony in flats; jackpine, fir, poplar and willow; $\frac{1}{4}$ section is very little use for anything but pasture land.

SEC. 17, NW. $\frac{1}{4}$.—Bottom land rising to 150 feet above the Columbia river; red loam; poplar, willow and birch; good agricultural land; $\frac{1}{4}$ section is nearly all river and slough, but there is a small piece of good land in southwest corner.

SEC. 18, NE. $\frac{1}{4}$.—Bottom land rising to bench land, bench land of no value except for pasture; bottom land rising to 150 feet above the Columbia river; red loam; poplar, willow and birch; good agricultural land; northeast corner of $\frac{1}{4}$ section is broken by slough.

SEC. 18, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 17, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 8, SE. $\frac{1}{4}$, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 9, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 3, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 4, NE. $\frac{1}{4}$.—Rough bench land rising from the Columbia to 1,000 feet above; red clay loam, stony in places; small poplar, willow, jackpine, spruce and fir; most of the land is too rough for crops, but it would make good pasture land; there is very little water throughout this district, and it could not be irrigated.

SEC. 19, SW. $\frac{1}{4}$, SEC. 18, NE. $\frac{1}{4}$, West of Columbia river.—Fractional $\frac{1}{4}$ sections, bottom land rising to bench land 500 feet above the Columbia river; bench land very rough, of no use except for pasture; bottom land rising 150 feet above the Columbia river; red loam; poplar, willow and birch; good agricultural land.

SEC. 19, SW. $\frac{1}{4}$.—Bottom land rising to bench land; 150 feet above the Columbia river, elevation of bottom land; red loam; poplar and willow, with some large spruce along edge of swamp; there is about 80 acres of good agricultural land in $\frac{1}{4}$ section.

NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ sections. A few acres of good bottom land in the southwest corner of each, rising from the Columbia river to 50 feet above; red loam; poplar and willow, with some large spruce; would make good agricultural land.

SEC. 20, NW. $\frac{1}{4}$.—Bottom land rising to bench land 600 feet above the Columbia river; the river cuts off southwest corner of $\frac{1}{4}$ section; sandy loam covered with poplar, willow and birch. There is a small strip of good land along the river bank.

NE. $\frac{1}{4}$.—Bottom land rising to bench land, about 750 feet above the Columbia river; red sandy loam; poplar, birch, willow and jackpine; a few acres of good bottom land in the south west corner rising to 100 feet above the river, and a small bench of good land above hill; remainder too rough for anything but pasture land.

SEC. 21, NW. $\frac{1}{4}$.—Bench land rising to high land, elevation 400 feet above the Columbia river and up; red sandy loam; poplar, willow and jackpine; only a small part of any agricultural value.

SW. $\frac{1}{4}$.—Bottom land rising to bench land; red clay loam; poplar, willow, birch and jackpine; some good agricultural land rising to 100 feet above the Columbia river in southwest corner; remainder too rough for anything but pasture.

SE. $\frac{1}{4}$.—Bench land running to high land, elevation 500 feet above the Columbia river and up; red sandy loam, stony to north; poplar, willow and jackpine, some large fir along east side; about half of $\frac{1}{4}$ section would make good agricultural land.

SEC. 22, SW. $\frac{1}{4}$.—Bench land rising to high land, 500 feet above the Columbia river and up; red clay loam; very stony; fir, poplar and willow, some large fir of market value; land of no agricultural value.

SEC. 29, NW. $\frac{1}{4}$.—Bench land rising to high land, elevation from 600 feet above the Columbia river and up; red loam; poplar, birch, jackpine and fir; would make good grazing land, and some benches would make good agricultural land; a good stream through $\frac{1}{4}$ section.

SW. $\frac{1}{4}$.—Rough bench land rising from the Columbia river to 800 feet above; red sandy loam, stony on hillsides; poplar, birch, willow and jackpine, with a few large fir; most of $\frac{1}{4}$ section is too rough except for pasture, but there is a small bench of good land above hills.

SE. $\frac{1}{4}$.—Bench land rising to high land, elevation of good land about 750 feet above Columbia river; red clay loam; jackpine, poplar and willow brush; about 20 acres good agricultural land in southwest corner.

SEC. 30, NW. $\frac{1}{4}$.—Bottom land and bench land, southwest corner cut off by slough; red clay loam, stony on hillside; poplar, willow, fir and jackpine of no market value; a strip of good bottom land rising from the river to 100 feet above; bench land no use except for pasture.

NE. $\frac{1}{4}$.—Rough bench land rising from the river to an elevation of 750 feet above the Columbia river; red clay loam; small poplar, fir and jackpine; of very little value unless for pasture.

SEC. 31, NW. $\frac{1}{4}$.—Bench land 600 to 800 feet above the Columbia river; red clay loam or white clay in swamps, very stony to north; cedar, spruce, fir, jackpine and poplar of no market value; most of $\frac{1}{4}$ section would make good agricultural land if drained

SW. $\frac{1}{4}$.—Rough bench land rising to 800 feet above the Columbia river; sandy loam, rather stony in southwest part; jackpine, fir and poplar of no market value; southwest corner is very rough, remainder good agricultural land.

NE. $\frac{1}{4}$.—Bench land rising to high land 750 feet above the Columbia river and up; sandy clay in places and white clay to west, very stony to northeast; poplar, birch, jackpine and cedar of no market value; much cedar swamp to west; good agricultural land if drained.

SE. $\frac{1}{4}$.—Bench land 600 to 900 feet above the Columbia river; red sandy clay, very stony in northeast corner; jackpine, fir and poplar of no market value; good agricultural land with a good stream through $\frac{1}{4}$ section.

SEC. 32, SW. $\frac{1}{4}$.—Bench land rising to high land, 750 feet above the Columbia river and up; red loam, very stony to north and east; poplar, birch, jackpine and fir; too rough for crops, but southeast part would make good grazing land; a good stream through $\frac{1}{4}$ section.

T. H. Plunkett, D.L.S. 1909.—Sections 14, 15, 16, 30 and 31 all lie on the benches where farming operations are as yet in the experimental stage. While most of the land is a clay loam, inclined in places to be gravelly, we encountered several large hay sloughs and swamps where the soil consisted of a rich black loam admirably suited for farming. The sloughs and swamps can, in nearly every case, be easily drained. The remainder would make good grazing land. No doubt the future of this bench land will depend on the severity of its summer frosts. These vary with different seasons. As yet there has been little activity in cultivating these benches. In the swamps there is a limited amount of merchantable timber consisting of cedar, spruce and hemlock, with some fir. The creek valley also contain limited quantities of the same timber. The prevailing wood, however, consists of small jackpine, birch, spruce and brush. Generally speaking, the land is easily cleared. During our surveys we noticed where small patches of vegetables had been planted by someone desiring to test the producing power of the soil and the effects of the summer frosts. It was evident, however, that this experiment had not received as much attention during the growth of the vegetables as would have been advisable. This tends to show, however, that attention is being drawn to these benches which offer broad opportunities to settlers if the climatic conditions are favourable. During some seasons irrigation is necessary in this district. In most places plenty of water is easily available from the mountain streams. A first-class wagon road from Golden up the valley to the Windermere district is a great advantage to the settlers, while Columbia river is navigable from Golden to Windermere, and freight and passenger steamers run tri-weekly between the two places. A railway up the right bank of the river is now under construction. Employment in the lumber woods along the river is obtainable during the entire year, while a large modern lumber mill at Golden also gives considerable work.

Tp. 25, R. 19, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 6, SW. $\frac{1}{4}$.—Bench land rising to high land 700 feet above the Columbia river and up; red clay loam, stony in places; jackpine and poplar, some cedar swamp; some good land along south and west, but northeast $\frac{1}{2}$ of $\frac{1}{4}$ section is useless.

Tp. 24, R. 20, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 26, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Bottom land rising to very rough bench land, bench land of no agricultural value; bottom land rises to 100 feet above the Columbia river; red loam; poplar, birch and willow; good agricultural land; about $\frac{1}{3}$ of northeast $\frac{1}{4}$ is cut off by a slough.

SEC. 25, SW. $\frac{1}{4}$; SEC. 24, NE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ sections, broken by swamps; bottom land rising to very rough bench land; bottom land rises from the Columbia river to 100 feet above; red loam; poplar, birch and willow, with some large spruce at edge of swamp; good agricultural land.

SEC. 33, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 34, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 27, NE. $\frac{1}{4}$; SEC. 26, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 25, SW. $\frac{1}{4}$; SEC. 23, NW. $\frac{1}{4}$, SEC. 24, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 18, NE. $\frac{1}{4}$.—Rough high land rising from the Columbia river to 1,000 feet above; red loam, stony in places; small jackpine, poplar and willow brush, with some spruce and small fir, scattered large fir; land is all very badly broken, and most of it is too rough for crops, but it would make pasture land; there is very little water through this section, and the land cannot be irrigated. There is a narrow strip of good bottom land between the base of the hills and the river. NW. $\frac{1}{4}$ and SW. $\frac{1}{4}$

of Section 34, NW. $\frac{1}{4}$ and NE. $\frac{1}{4}$ of Section 26, SW. $\frac{1}{4}$ of Section 25, and NE. $\frac{1}{4}$ of Section 24 are fractional $\frac{1}{4}$ sections broken by the Columbia river sloughs.

SEC. 34, SE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section.—Bottom land rising to bench land, bottom land rises to 100 feet above the Columbia river; all covered with poplar, birch and willow; bench land very rough; bottom land red loam; some large spruce at edge of slough; good agricultural land.

SEC. 35, SW. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section.—A small area of good bottom land in southwest corner rising to 100 feet above the Columbia river; poplar, willow and alder; good agricultural land.

SEC. 36, NW. $\frac{1}{4}$.—Very rough bench land rising to 700 feet above the Columbia river; red sandy loam, stony on hillside; poplar, birch and willow; would make good pasture land.

NE. $\frac{1}{4}$.—Bench land 600 to 800 feet above the Columbia river; red sandy loam; timber nearly all jackpine, with some cedar swamp to the north; most of $\frac{1}{4}$ section slopes gently to south; plenty of water; would make good land.

Tp. 25, R. 20, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 1, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land 400 to 700 feet above the Columbia river; red clay loam, very stony in many places; mostly jackpine and small fir; most of the ground is too rough or stony for cultivation; there is a good stream through both $\frac{1}{4}$ sections; would make good grazing land.

SE. $\frac{1}{4}$.—Bench land 600 to 800 feet above the Columbia river; red clay loam with much stone in places, particularly to the northeast; jackpine with some poplar and fir; some good agricultural land in section; whole $\frac{1}{4}$ section slopes gently to the southwest.

SEC. 2, NW. $\frac{1}{4}$.—Southwest corner of $\frac{1}{4}$ section taken, remainder bench land, very rough, rising from 100 to 600 feet above the Columbia river; red clay loam; poplar and jackpine and small fir; land of no agricultural value, would do for grazing.

NE. $\frac{1}{4}$.—Rolling bench land 400 to 600 feet above the Columbia river; red clay loam mixed with gravel, stony in places; thick fir and jackpine, scattered large fir; some good agricultural land in $\frac{1}{4}$ section; there is a small stream along the west side.

SEC. 10, NE. $\frac{1}{4}$.—Rolling bench land 500 to 800 feet above the Columbia river; red sandy loam, very stony; poplar and jackpine; $\frac{1}{4}$ section is badly broken, and of very little agricultural value.

SEC. 11, NW. $\frac{1}{4}$.—Rolling bench land 600 to 900 feet above the Columbia river; red clay loam, very stony to the northeast; poplar, jackpine and willow; poor agricultural land, but would make pasture land.

S.W. $\frac{1}{4}$.—Bench land 400 to 800 feet above the Columbia river; red clay loam, stony in places; poplar, willow, small fir and jackpine; some good agricultural land, especially on the east side.

SE. $\frac{1}{4}$.—Bench land rising to high land 600 to 900 feet above Columbia river; red sandy loam mixed with gravel, stony in places; small fir and jackpine, with some poplar and birch; some fair agricultural land in southeast corner.

SEC. 15, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land rising to high land, 600 feet above Columbia river and up; red clay loam with gravel; poplar, birch, jackpine and fir; much of the ground is rough, but there is some good agricultural land.

SW. $\frac{1}{4}$.—Rolling bench land 500 to 1,000 feet above the Columbia river; red clay loam; poplar and jackpine, with some small spruce and fir; good agricultural land; rather rough along the east boundary.

SEC. 16, NE. $\frac{1}{4}$.—Rolling bench land 300 to 800 feet above the Columbia river; red clay loam with gravel; jackpine and poplar with some small fir and birch; some good agricultural land.

NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land rising from the Columbia river to about 600 feet above; red clay loam; poplar and jackpine, with some small spruce and fir; the southwest half of each is badly broken; some good agricultural land in the north-east portions, especially in the southwest $\frac{1}{4}$ section.

SEC. 17, NE. $\frac{1}{4}$.—South half of $\frac{1}{4}$ section is taken; north half very rough bench land rising from the Columbia river to 600 feet above; red clay loam; poplar and willow; of very little agricultural value.

SEC. 18, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 7, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 8, NW. $\frac{1}{4}$; SEC. 5, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 4, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough high land rising to 800 feet above the Columbia river; red clay loam, much of it very stony, with rock outcrops on the ridges; principally old brule overgrown with jackpine, poplar and willow. There is some large fir, chiefly in Section 5, but all the good timber near the river has been taken off. There are a few small benches of good land, but nearly all of it is too rough for anything but pasture land. In the southeast $\frac{1}{4}$ of Section 18 there is a small area of bottom land, cedar swamp with some large spruce, which would make good land.

SEC. 19, NE. $\frac{1}{4}$.—Very rough bench land rising from the Columbia river to an elevation of 600 feet above; sandy clay loam; jackpine, fir, poplar and birch; would make pasture land.

SEC. 20, NW. $\frac{1}{4}$.—Rough bench land rising from near the Columbia river to 600 feet above; red clay loam, stony in places; poplar, birch, willow, jackpine and small fir; rather rough for anything but grazing.

SW. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section.—The west half is taken, remainder is either swamp or steep hillside, and of no agricultural value except for grazing land.

NE. $\frac{1}{4}$.—Rolling bench land 600 to 900 feet above the Columbia river; red and black loam mixed with clay, stony in places; jackpine, birch and poplar; rock outcrops show on some of the ridges, but some of the benches would make good land.

SE. $\frac{1}{4}$.—Rough bench land rising from near the Columbia river to 700 feet above; red clay loam, stony in places; poplar, birch, jackpine and small fir; very rough to southwest, and many ridges above show rock outcrops; not much good for agriculture, but would make grazing land.

SEC. 21, NW. $\frac{1}{4}$.—Bench land 800 to 1,200 feet above the Columbia river; red clay loam, rather stony, especially to west; jackpine and poplar, with some large spruce and fir; some good agricultural land in $\frac{1}{4}$ section.

SW. $\frac{1}{4}$.—Rolling bench land 600 to 1,000 feet above the Columbia river; red clay loam, rather stony, with rock outcrops in places; jackpine, poplar and willow; some good agricultural land.

NE. $\frac{1}{4}$.—Bench land rising to high land, 1,000 feet above the Columbia river and up; red clay loam, stony in places; small fir and jackpine; land of very little value except for pasture.

SE. $\frac{1}{4}$.—Rolling bench land 700 to 1,000 feet above the Columbia river; red clay loam, stony in places, especially towards the east; poplar, jackpine and small fir; good agricultural land.

SEC. 28, SW. $\frac{1}{4}$.—Bench land rising to high land 900 to 1,300 feet above the Columbia river; red clay loam, very stony; jackpine; part of $\frac{1}{4}$ section would make pasture land.

SEC. 29, NW. $\frac{1}{4}$.—Bench land 800 to 1,000 feet above the Columbia river; red clay loam, stony in places; jackpine, poplar and willow, with some small spruce and fir; most of the $\frac{1}{4}$ section could be cultivated.

SW. $\frac{1}{4}$.—Bench land 600 to 900 feet above the Columbia river; red clay loam, stony in places; jackpine and poplar, with some small fir and spruce; much of the $\frac{1}{4}$ section would make good agricultural land; there is a beaver meadow along the south boundary.

NE. $\frac{1}{4}$.—Bench land rising to high land 800 feet above the Columbia river and

up; red clay loam, very stony; jack pine, poplar and willow; would make good grazing land.

SE. $\frac{1}{4}$.—Rolling bench land, 750 to 1,200 feet above the Columbia river; red clay loam, very stony; jackpine, with some poplar and willow; would make pasture land.

SEC. 30, NW $\frac{1}{4}$.—Bench land 500 to 800 feet above the Columbia river; red clay loam; jackpine, poplar and birch, with scattered large fir; $\frac{1}{4}$ section is badly broken by Washout creek, but part of it would make good agricultural land.

SW. $\frac{1}{4}$.—Bench land 200 to 500 feet above the Columbia river; clay loam; jackpine, fir, poplar and willow; very badly broken by Washout creek, and of no agricultural value.

NE. $\frac{1}{4}$.—Rolling bench land 600 to 900 feet above the Columbia river; red clay loam, stony to north; jackpine, spruce, poplar and willow; would make agricultural land.

SE. $\frac{1}{4}$.—Rolling bench land 400 to 800 feet above the Columbia valley; red clay loam, stony in places; jackpine with some spruce, poplar and willow; there is some good agricultural and in $\frac{1}{4}$ section.

SEC. 31, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Rough bench land rising to high land, elevation from 900 feet above the Columbia river and up; jackpine, with some good spruce and fir; would make good grazing land.

SE. $\frac{1}{4}$.—Bench land 800 to 1,200 feet above the Columbia river; red clay loam, stony to north; small jackpine, fir and poplar; the south half might be used for agricultural purposes.

SW. $\frac{1}{4}$.—Rough bench land 700 to 900 feet above the Columbia river; red sandy loam, very stony; thick jackpine, with some large spruce to west; would make grazing land.

SEC. 32, SW. $\frac{1}{4}$, SE $\frac{1}{4}$.—Rough bench land rising to high land, elevation 900 to 1,200 feet above the Columbia river; red clay loam, very stony; jackpine and poplar, with some spruce and fir up to 18 inches diameter; would make grazing land.

D. A. Smith, D.L.S., 1910.—This district is at all times accessible by a good wagon road, and during the summer access may be had by boat. The soil is generally a clay loam, with a gravelly clay subsoil, and is suitable for farming or fruit raising, although so far the larger varieties of fruit have not flourished, due largely to improper cultivation, and to severe winters. The best of the timber has been set apart in timber berths, and outside of this there is only a thick growth of jack pine, pine, fir, cedar, poplar and birch, averaging about 7 or 8 inches in diameter. There is no natural growth of hay of any value, but water is fresh and clear, and found in numerous creeks, some of which could be used for irrigating small areas. The lower lands in the river flat are flooded during high water to a depth of about 6 feet. There is no danger of summer frosts in the lower lands, but reports regarding the higher lands are indefinite. The rainfall is not sufficient, and the cultivated lands are irrigated. There is enough wood fuel for some time to come, and game consisting of grouse, deer, brown and grizzly bears, sheep and goats, is fairly plentiful.

TP. 25, R. 21, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 25, NW. $\frac{1}{4}$.—Rough bench land rising from the Columbia river to an elevation of 700 feet above; soil, clay loam; poplar, birch, jackpine and fir; would make good grazing land.

NE. $\frac{1}{4}$.—Rolling bench land, elevation 400 to 700 feet above the Columbia river; red clay loam; poplar and jackpine, with large fir to north; north half of $\frac{1}{4}$ section would make good agricultural land, but the south half is pretty rough.

SE. $\frac{1}{4}$.—Rough bench land rising from the Columbia river to 500 feet above; soil very rocky; small poplar, birch, willow, fir and jackpine; most of $\frac{1}{4}$ section is worth less.

SEC. 26, NE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section very rough bench land rising from near the Columbia river to an elevation of 400 feet above; clay loam with gravel; poplar, willow, and birch, with large fir; good grazing land; almost two-thirds of $\frac{1}{4}$ section in slough.

SEC. 32, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 29, NE. $\frac{1}{4}$; SEC. 28, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 27, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 22, NE. $\frac{1}{4}$; SEC. 23, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 24, SW. $\frac{1}{4}$; SEC. 13, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough high land rising steeply from the Columbia river to 800 or 1,000 feet above; red loam, very stony in most places; old brule, overgrown with small jackpine, poplar, and willow brush; there are some small benches of good agricultural land, but most of it is too rough except for pasture land.

SEC. 33, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, West of Columbia river.—Fractional $\frac{1}{4}$ section, badly broken by sloughs; some bottom land to west; soil, black loam, stony in places, very wet; large cedar and spruce; would make good hay land if drained.

SEC. 33, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ sections, badly broken up by sloughs; some bottom land to west; soil, black loam, stony in places, very wet; large cedar and spruce; would make good hay land if drained.

SEC. 34, NW. $\frac{1}{4}$.—Nearly all slough; there is about 20 acres of very rough bench land in northeast corner rising from slough; it is of very little value.

NE. $\frac{1}{4}$.—Rough bench land rising from the slough to an elevation of 700 feet above the Columbia river; red loam mixed with gravel; poplar, willow, birch, spruce, fir and jackpine; nearly all land too rough for crops; would make grazing land; there is about 50 acres of slough in southwest corner.

SEC. 35, NW. $\frac{1}{4}$.—Rough bench land rising from 100 to 800 feet above the Columbia river; clay loam, stony towards north; small fir, jackpine, poplar, birch and willow; some good agricultural land in southeast, but most of it is too rough except for grazing; there is a good stream through the section.

SW. $\frac{1}{4}$.—Fractional quarter section, rough bench land rising from the Columbia river to an elevation of 500 feet above; soil good; poplar and birch with some large fir; $\frac{1}{4}$ section is too rough for crops; would make grazing land.

NE. $\frac{1}{4}$.—Rolling bench land rising from 500 to 900 feet above the Columbia river; soil very stony, with rock outcrops; poplar, fir and jackpine; $\frac{1}{4}$ section of very little value except for grazing.

SE. $\frac{1}{4}$.—Rolling bench land rising from the Columbia river to 600 feet above; clay loam; poplar, willow, birch, fir, spruce and jackpine; there are some strips of good agricultural land through section, and plenty of water.

SEC. 36, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land rising from 800 to 1,000 feet above the Columbia river; red clay loam; poplar, willow, birch, jackpine and spruce, with much large fir; good agricultural land; slopes to south and is not badly broken.

NW. $\frac{1}{4}$.—Rolling bench land rising from 600 to 1,000 feet above the Columbia river; clay loam, very rocky along west side; very wet and swampy to southeast; much large spruce and fir; part of section would make good agricultural land, the rest would be good for grazing.

SW. $\frac{1}{4}$.—Rolling bench land, elevation 400 to 800 feet above the Columbia river; red clay loam; poplar, birch, spruce and fir; most of $\frac{1}{4}$ section good agricultural land, slopes principally to southwest.

W. J. Deans, D.L.S., 1910.—The surface of the northeast and part of the northwest quarters of section 34 are steeply-sloping hillsides and benches, while the remainder of the section is in the flood lands of Columbia river. The soil of the uplands is clay and stones, covered with small jackpine, poplar southwest corner flood lands. The remainder of the section is a rolling bench and a few large fir. Columbia river, the Kootenay Central railway and a wagon road cross this section and also section 35. The surface of the southwest $\frac{1}{4}$ of section 35 is for the most part steeply-sloping hillsides, and in the southwest corner flood lands. The remainder of the section is a rolling bench somewhat rough towards the north and west. It is covered with fir, pine and birch,

not very good for lumber but a large amount of it is very useful for building purposes. The whole of section 26, with the exception of about ten acres at the southwest corner, is flood lands of Columbia river, which flows from south to north through the centre of the section. The southwest quarter is a little more elevated than the rest of the section, and is drained by a small creek which runs in a northerly direction. It is surveyed as Timber Berth No. 543. The timber on this quarter section is large pine, spruce and cedar. The soil is a heavy clay. The north half of section 25 is a rolling bench broken in some parts by ravines from forty to eighty feet in depth. It is covered with a growth of fir and jackpine of medium size. The south half is for the most part but little elevated above the flood level of Columbia river, and where it is not cultivated is thickly wooded with spruce, poplar and birch, and is drained by Washout creek. Section 36 is a high rolling bench sloping to the south and west, and except for part of the northwest quarter is covered with fir and spruce from twelve to eighteen inches in diameter. The southeast part of the section is in timber berth No. 421. The soil in this section is sand and clay, with patches of rock. There are two small creeks and several roads and trails made by the lumber men running through the section.

Tp. 26, R. 21, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 2, SE. $\frac{1}{4}$.—Rolling bench land 800 to 1,000 feet above the Columbia river; red clay loam, becoming stony to north; poplar, birch and jackpine; good agricultural land in southwest part; nearly all slopes are gentle, but soil is thin on the ridges; there is a good stream through $\frac{1}{4}$ section.

NW. $\frac{1}{4}$.—Rolling bench land rising to high land 700 feet above the Columbia river and up; red clay loam, becoming stony towards base of mountain; poplar, willow and jackpine; most of $\frac{1}{4}$ section worthless.

SW. $\frac{1}{4}$.—Rolling bench land 600 to 700 feet above the Columbia river; red sandy clay; poplar and jackpine; the southeast part of $\frac{1}{4}$ section is very rough, but there is good agricultural land on the east; there is a good stream flowing through the section, and a small swamp.

SEC. 3, NE. $\frac{1}{4}$.—Rolling bench land 600 to 800 feet above the Columbia river; sandy clay with occasional rock outcrops, and very dry; poplar and jackpine; much of land worthless except for pasture; it is very dry and much of it cannot be irrigated; there is a meadow and a good stream in the northwest corner.

SE. $\frac{1}{4}$.—Rolling bench land 300 to 700 feet above the Columbia river; red clay loam; poplar, willow, jackpine and fir; southeast part of section too rough to be of any use; remainder is good agricultural land, but could not be irrigated, and soil seems very dry; there are some small strips of swamp along the south side.

NW. $\frac{1}{4}$.—Rolling bench land 400 to 700 feet above the Columbia river; clay loam with gravel; poplar and jackpine, with some large fir; some good agricultural land in $\frac{1}{4}$ section; there are several small swamps and a good stream through the north part; good grazing land.

SW. $\frac{1}{4}$.—Rough bench land rising from the Columbia river to 600 feet above; red clay loam; poplar, willow and jackpine, with some large fir on hill above river; most of $\frac{1}{4}$ section very rough, and could not be easily irrigated; would make good grazing land; about 40 acres in southwest corner is cut off by the river.

SEC. 4, NE. $\frac{1}{4}$.—Bench land rising to 500 feet above the Columbia river; red sandy loam; poplar, willow and jackpine, with some large fir; $\frac{1}{4}$ section has a good stream flowing through it, but is very badly broken; about 40 acres in southwest corner is slough; most of it is too rough for anything but grazing.

SEC. 5, NW. $\frac{1}{4}$.—Bottom land rising to rough bench land; bench land of no agricultural value; old brule overgrown with jackpine; bottom land black loam, very wet; large cedar and spruce; would make good hay land if drained.

NE. $\frac{1}{4}$.—A small area of bottom land in southwest corner; black loam, very swampy; large spruce and cedar; would make good hay land if drained; remainder is all slough.

SEC. 7, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land rising to steep mountain side, bench land 500 to 600 feet above the Columbia river; red loam, very stony in places; old brule overgrown with poplar, willow and jackpine; there are some small benches but very little area of any agricultural value; part of the northeast $\frac{1}{4}$ section is cut off by a slough.

SEC. 8, SW. $\frac{1}{4}$.—A small area of bottom land; black loam, very swampy; large spruce and cedar, with thick undergrowth of willow and alder; would make good land if drained; most of $\frac{1}{4}$ section is cut off by the Columbia river and slough.

SE. $\frac{1}{4}$.—A small area of bottom land in northeast corner; black loam; large birch, poplar and willow, with some good spruce; land is very wet; good hay land if drained; the remainder is slough.

NW. $\frac{1}{4}$.—Bottom land, black loam with gravel in places; spruce, small poplar and willow; only a small portion in northeast corner not taken, that is swampy; good hay land.

SEC. 9, NE. $\frac{1}{4}$.—Bench land rising to high land, elevation from 400 feet above the Columbia river and up; red clay loam in southwest, very rocky on east side; poplar, birch, jackpine and fir; the north and east of section is worthless, but the southwest part (about 80 acres) is very good; there is a good spring in the northeast corner.

SE. $\frac{1}{4}$.—Rolling bench land from 300 to 700 feet above the Columbia river; red clay loam mixed with gravel; jackpine, fir, poplar and willow; it is good land, but seems very dry and cannot be irrigated.

SW. $\frac{1}{4}$.—Bottom land rising to bench land; bottom land about 20 acres in northwest corner black loam; poplar and willow, with some large spruce and cottonwood; it is very wet; bench land rises to elevation of 400 feet; red sandy loam; poplar, willow and jackpine, with a few large fir; greater part of $\frac{1}{4}$ section too rough except for grazing; about 45 acres of $\frac{1}{4}$ section is slough.

SEC. 10, SE. $\frac{1}{4}$.—Bench land rising to high land; bench land 700 to 800 feet above the Columbia river; red loam mixed with gravel and becomes stony towards mountain; jackpine, fir and poplar, with a small strip of cedar swamp near base of mountain; there is a large slough and meadow with a good stream at southwest corner; most of $\frac{1}{4}$ section is worthless.

SW. $\frac{1}{4}$.—Bench land rising to high land on north; bench land 500 to 800 feet above the Columbia river; sandy clay mixed with gravel; jackpine and fir, with a little spruce; $\frac{1}{4}$ section is not badly broken up except near north boundary; the south half would make good agricultural land, and there is a good stream through the east side.

SEC. 16, SE. $\frac{1}{4}$.—Very rough bench land rising to high land 450 feet above the Columbia river and up; red clay and loam, very stony in places; small fir, jackpine and spruce; $\frac{1}{4}$ section is broken by Horse Creek canyon, and is practically worthless.

NW. $\frac{1}{4}$.—Rolling bench land rising to high land 250 feet above the Columbia river and up; red clay loam, very stony; small fir, jackpine, poplar and willow; there is no water on $\frac{1}{4}$ section; would make good grazing land.

SW. $\frac{1}{4}$.—Rolling bench land 140 to 500 feet above the Columbia river; red clay loam, very stony; poplar, willow and small jackpine; most of the $\frac{1}{4}$ section is very rough and very stony; most of it is worthless except for grazing.

SEC. 18, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land 400 to 600 feet above the Columbia river; red loam; much loose stone with rock outcrops on ridges; old brule overgrown with poplar and willow; would make good pasture land, and some small benches would make good agricultural land; there is a small slough on the line between the two $\frac{1}{4}$ sections.

SE. $\frac{1}{4}$.—Bottom land rising to bench land, about 500 feet above the Columbia river; red loam, very stony in places; old brule overgrown with willow and poplar; of no agricultural value; east part of $\frac{1}{4}$ section is cut off by a slough.

SEC. 19, SW. $\frac{1}{4}$.—Very rough bench land rising to 500 feet above the Columbia river; red clay loam, stony in places; old brule covered with poplar and willow brush; of no agricultural value; badly broken by Canyon creek.

SEC. 20, NE. $\frac{1}{4}$.—Bench land rising to 600 feet above the Columbia river; soil, red clay, very stony; poplar, willow and jackpine, with a few large fir; $\frac{1}{4}$ section slopes mainly to the west and is very rough; good grazing land.

SEC. 21, NW. $\frac{1}{4}$.—Bench land rising to high land, elevation 450 feet above the Columbia river and up; very stony; poplar, small fir, willow and jackpine; practically worthless except a narrow strip along the west side.

SW. $\frac{1}{4}$.—Rolling bench land rising to high land, elevation from 350 feet above the Columbia river and up; red clay loam, stony; poplar, willow and jackpine; there is no water and no means of irrigation; good grazing land.

SEC. 29, NW. $\frac{1}{4}$.—Rough bench land rising to high land, elevation 600 feet above the Columbia river and up; red clay loam, very stony towards mountain; timber mostly poplar, willow and jackpine; would make good pasture land.

East $\frac{1}{2}$ of SW. $\frac{1}{4}$.—Bench land rising to 400 feet above the Columbia river; soil, stony; poplar and willow brush; very steep slopes; practically worthless.

SE. $\frac{1}{4}$.—Bench land rising to high land, elevation up to 600 feet above the Columbia river; red clay loam, very stony; poplar and willow, with a few large fir in the southeast corner; very rough for anything but pasture land; there is a small spring in southeast corner.

SEC. 31, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Bench land rising to high land, 200 feet above the Columbia river and up; clay loam where level; poplar, willow and jackpine; most of $\frac{1}{4}$ section is too rough except for pasture land.

SE. $\frac{1}{4}$.—Bench land rising to high land, 200 feet above the Columbia river and up; very stony; poplar, willow and jackpine; west half of $\frac{1}{4}$ section is taken, and east half would make pasture land.

SEC. 32, SW. $\frac{1}{4}$.—Bench land rising to high land, bench land 400 feet above Columbia river; red clay loam, stony on steep slopes; poplar, willow and fir; $\frac{1}{4}$ section practically useless.

W. J. Deans, D.L.S., 1910.—The southwest quarter of section 3 is a sloping hillside and bench land, the southwest corner being mostly a marsh. The rest of the section is a rolling bench, and from this bench the land slopes steeply down to the flats of Columbia river. The soil is for the most part sandy clay and stones, drained by a creek of good water which crosses the section diagonally. The timber on this section is mostly jackpine and poplar brush, with some good fir lumber along the slopes of the river bank. The Kootenay Central railway and the Kootenay wagon road run through the southwest quarter. The south half of section 2 is a rolling bench of clay land covered with poplar and jackpine brush and a few scattered jackpine and spruce of medium size. The north half is mostly a steep mountainside, legal subdivision 12 only being suitable for agriculture. The northwest quarter of section 4 is a steeply-sloping hillside to the northeast while the rest of the section is almost wholly in the flats of Columbia river, which, along with the Kootenay Central railway and a wagon road passes through the southeast, northeast and northwest quarters. The uplands are formed of a light clay soil somewhat stony and are covered with jackpine, poplar and birch bush and a few scattered large trees. There is a small stream of good water flowing through the northeast quarter. The northeast quarter and the eastern parts of the northwest and southeast quarters of section 5 are but slightly elevated above the level of the flood lands, and are for the most part covered with a heavy growth of cedar, spruce and pine. The eastern side of the section is marsh and hay lands,

while on the west there are steep hillsides and rolling benches cut by ravines. The soil on the lowlands is clay, very stony in some parts, while the soil on the uplands is sand or sandy clay and stones. There are two creeks crossing this section in an easterly direction. The uplands are poorly wooded with a growth of small jackpine and windfalls. The surface of section 9 is rolling benches and steep slopes of a light clay soil, and in the northeast quarter very stony. A part of the southwest quarter falls in the flat of Columbia river and is crossed by the Kootenay Central railway and a wagon road. The west half is covered with a thick growth of jackpine and fir from four to ten inches in diameter, together with some large fir, while on the west the growth changes to jackpine and poplar brush. There is some good lumber and a large quantity of building timber on this section. The western half of section 16 is a rolling bench of clay, somewhat stony, while the eastern half is steeply-sloping hillsides and ravines. Horse creek crosses this section from east to west, running through a deep ravine. The eastern half of the section is covered with jackpine and fir from four to ten inches in diameter, while the western parts are covered with sparse jackpine and poplar bush. The eastern part of section 17 is a rolling bench sloping towards Columbia river on the west. Its soil is a light clay with stones, and is covered for the most part with pine and poplar bush. The western part of this section is flooded land through which Columbia river flows from south to north. The northeast quarter of section 30 is a hillside broken with ravines sloping to the flooded lands of Columbia river, which take up the western half of the section. The uplands are covered with bush and scattered spruce and fir, and have a soil of sandy clay and stones. The Kootenay Central railway and a wagon road run through the northeast quarter. The south half of the northeast quarter of section 1 slopes south and west. The north end is at the foot of a high, rocky mountain. The soil is clay and sand with stones, and is covered with a thick growth of brush, with scattered fir and hemlock, fourteen to eighteen inches in diameter. The southeast quarter of section 10 is high bench land with a clay soil quite suitable for farming purposes. This quarter is covered with fir, spruce and cedar, chiefly along the ridge through the central portion. There is a small pond of good water near the southeast corner.

Tp. 27, R. 21, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 5, NW. $\frac{1}{4}$.—Bench land rising to high land, 350 feet above the Columbia river and up; poplar, willow and jackpine; land is worthless, except a few acres in southeast corner.

SW. $\frac{1}{4}$.—Rough bench land rising to high land 100 to 500 feet above the Columbia river; clay loam; poplar, birch and willow brush; most of $\frac{1}{4}$ section too rough for crops; a good stream in south side.

SEC. 6, NE. $\frac{1}{4}$.—Rough bench land rising from the Columbia river to 500 feet above; sandy loam, rather stony; poplar, willow and jackpine; the northwest part of $\frac{1}{4}$ section is taken, and the rest is practically useless except for pasture.

SEC. 7, NE. $\frac{1}{4}$.—Rolling bench land rising to 500 feet above the Columbia river; sandy loam with gravel; jackpine, poplar and willow; $\frac{1}{4}$ section is very badly broken by the Kicking Horse canyon; it is very dry, and cannot be irrigated.

SE. $\frac{1}{4}$.—Rough bench land rising to high land 200 to 600 feet above the Columbia river; rocky in places; fir, jackpine and poplar; the southwest part of $\frac{1}{4}$ section is taken, and the remainder is too rough to be of use.

SEC. 8, NE. $\frac{1}{4}$.—Rough bench land rising to high land, elevation 400 feet above the Columbia river and up; clay loam; fir, jackpine and willow; of no use for crops, but south side would make pasture land.

SEC. 17, SW. $\frac{1}{4}$.—Bench land rising to high land, elevation from 600 feet above the Columbia river and up; clay loam; poplar, willow, fir and jackpine; the southeast part of $\frac{1}{4}$ section is good, but cannot be irrigated.

SEC. 18, NE. $\frac{1}{4}$.—Rolling bench land rising to high land, elevation from 500 feet above the Columbia river and up; good soil; poplar, willow and jackpine; most of $\frac{1}{4}$ section is good land, and there is a small creek through the south side.

SE. $\frac{1}{4}$.—Rolling bench land rising from the Kicking Horse river to an elevation of about 600 feet above the Columbia river; clay loam; poplar, willow, jackpine and fir; good farm land if not too dry; a small stream runs through the west half and along the south edge it is badly broken by slopes to the Kicking Horse river.

NW. $\frac{1}{4}$.—Rolling bench land 400 to 650 feet above the Columbia river; clay loam; poplar, willow, birch and jackpine; good farm land if not too dry; there is a small spring at northeast corner.

SW. $\frac{1}{4}$.—Rolling bench land 300 to 400 feet above the Columbia river; clay loam; jackpine, fir, poplar and willow; good farm land; there is no water in $\frac{1}{4}$ section, and south edge is badly broken by slopes to the Kicking Horse canyon.

SEC. 19, NE. $\frac{1}{4}$.—Bench land rising to high land, 750 feet above the Columbia river and up; clay loam; poplar, willow brush and soapberries; east half of $\frac{1}{4}$ section very hilly, west half nearly level; no water on $\frac{1}{4}$ section, and cannot be irrigated; good agricultural land if not too dry.

SE. $\frac{1}{4}$.—Bench land rising to high land, 670 feet above the Columbia river and up; clay loam; poplar, willow, birch and jackpine; west half of $\frac{1}{4}$ section is rolling but not badly broken; no water on $\frac{1}{4}$ section, and it cannot be easily irrigated; good agricultural land on west if not too dry.

NW. $\frac{1}{4}$.—Bench land 650 feet to 800 feet above the Columbia river; clay loam; poplar, willow brush and jackpine; $\frac{1}{4}$ section rolling gently to south; good land, but no water in $\frac{1}{4}$ section.

SW. $\frac{1}{4}$.—Rolling bench land 550 to 750 feet above the Columbia river; clay loam; poplar, willow brush and jackpine; slopes mostly to south; good agricultural land; there is a small pond in the northeast corner and a spring in the southeast corner.

SEC. 30, NE. $\frac{1}{4}$.—Bench land 700 to 800 feet above the Columbia river; reddish clay; poplar, willow and jackpine, with some good spruce along Hospital creek, within Timber Berth 67; would make good pasture land.

SE. $\frac{1}{4}$.—Bench land rising to high land on east side, 750 feet above the Columbia river and up; clay loam; too rough for crops, unless a narrow strip on west side would make pasture land; there is no water on $\frac{1}{4}$ section, and it cannot be easily irrigated.

NW. $\frac{1}{4}$.—Bench land 600 to 800 feet above the Columbia river; clay loam; poplar and willow brush, small spruce, fir and jackpine; ground is rolling, and most of it can be irrigated.

SW. $\frac{1}{4}$.—Bench land rising from 700 to 800 feet from the Columbia river; clay loam; jackpine and poplar; most of land slopes gently to south; good land, but cannot be easily irrigated.

SEC. 31, SW. $\frac{1}{4}$.—Bench land rising to high land, elevation from 700 feet above the Columbia river up; small poplar and jackpine; would make good pasture land with a good creek through $\frac{1}{4}$ section.

P. B. Street, D.L.S., 1910.—This township can be reached by roads from Golden. The main trail southward runs through sections 6 and 7. Five-sixths of the township is mountainous country and useless. Sections 6, 7, 18, 19, 30 and 31 contain some good bench land. Probably two-thirds of these sections are of value for farming, and over one-half of the remainder is excellent pasture land. Most of the bench lands are sufficiently level to permit of ordinary farming operations being carried on at a profit. The soil is mostly sandy loam. Water can be found almost everywhere, in springs or small creeks, and the supply is sufficient for the use of settlers. No timber of value is left, but plenty of fuel, such as birch, fir, spruce and jack pine can be had. No water-powers exist except on the Kicking Horse river. Up-to-date electric power has been

supplied by the Columbia River Lumber Company's mill at a much cheaper rate than it could be obtained by hydro-electric development. As this township is very near the mountains it is probably subject to summer frosts, and better adapted to the raising of grain or root crops than to the growing of fruit. No minerals are being mined in this township. Partridges, hares, deer, lynx, bears and goats are numerous.

Tp. 26, R. 22, W. 5th Mer. *M. P. Bridgland, D.L.S., 1903.*

SEC. 24, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Very rough bench land, 500 to 1,000 feet above the Columbia river; rock and shale; old brule overgrown with poplar and willow; of no agricultural value.

NE. $\frac{1}{4}$.—Bottom land rising to rough bench land 500 feet above the Columbia river; all very rough and stony; old brule overgrown with poplar and willow; of no agricultural value.

SEC. 25, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Very rough bench land 500 to 1,000 feet above the Columbia river; rock and shale; old brule overgrown with poplar, willow and jackpine; some large spruce and fir to west; land of no agricultural value.

NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bottom land rising to rough bench land, 500 feet above the Columbia river; very stony; old brule overgrown with poplar and willow; of no agricultural value; northeast $\frac{1}{4}$ section is broken by a slough.

SEC. 35, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land rising from the Columbia river to 1,000 feet above; soil very rocky; old brule overgrown with small poplar, willow, jackpine, spruce and fir of timber value; much windfall; of no agricultural value.

SEC. 36, SW. $\frac{1}{4}$.—Rough bench land rising from the slough to 500 feet above the Columbia river; fractional section; rock and shale; old brule overgrown with poplar, willow and jackpine; of no agricultural value.

Tp. 27, R. 22, W. 5th Mer. *M. P. Bridgland, D.L.S., 1903.*

SEC. 1, NW. $\frac{1}{4}$.—Rough bench land rising about 400 feet above the Columbia river; clay loam, very stony; small poplar, willow, jackpine and fir; all good timber cut out; only small benches of agricultural value; over half of $\frac{1}{4}$ section is river and slough.

SW. $\frac{1}{4}$.—Rough bench land rising to 600 feet above the Columbia river; very stony; poplar, willow, jackpine and fir; land of no agricultural value; part of northeast corner is cut off by slough.

SEC. 2, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Very rough bench lands from 200 to 1,000 feet above the Columbia river; red clay loam, very stony in most places; jackpine, fir, spruce, poplar and willow; all good timber cut out; only very small benches of any agricultural value.

SEC. 10, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land from 800 to 1,000 feet above the Columbia river; clay loam with gravel, very stony in many places; fir, balsam, spruce and jackpine; some good timber in southeast part of section; only very small benches of any agricultural value.

SEC. 11, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench lands rising about 900 feet above the Columbia river; clay loam, very stony; small poplar, jackpine, spruce and fir; good timber cut out; only a few small benches of any agricultural value.

SEC. 14, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Very rough bench lands rising to 800 feet above the Columbia river; clay loam, very stony; small spruce, fir and jackpine; of no agricultural value; both $\frac{1}{4}$ sections are broken in the east by the Columbia river.

SEC. 15, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land 150 to 1,000 feet above the Columbia river; very stony; poplar, jackpine, small spruce and fir; no value; land of no agricultural value.

SEC. 16, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land from 600 to 1,000 feet above the Columbia river; very stony; jackpine, spruce, fir and balsam; no value; land of no agricultural value.

SEC. 22, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land rising to about 800 feet above the Columbia river; soil very stony; spruce, fir, jackpine, poplar, willow; of no agricultural value.

NE. $\frac{1}{4}$.—Bottom land rising to bench land; bench land very rough and of no agricultural value; bottom land rising to about 100 feet above the Columbia river; clay loam, stony in places; poplar, willow and birch; good agricultural land.

SEC. 24, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Rough bench land rising to 700 feet above the Columbia river; sandy clay loam; poplar, jackpine and fir; would make good pasture land.

SEC. 25, NW. $\frac{1}{4}$.—Rolling bench land 600 to 800 feet above the Columbia river; sandy clay loam; small spruce, fir, jackpine, poplar and willow; good agricultural land if not too dry; not easily irrigated.

SW. $\frac{1}{4}$.—Rolling bench land 400 to 600 feet above the Columbia river; sandy clay loam; small spruce, fir, jackpine and poplar; good agricultural land if not too dry; not easily irrigated; $\frac{1}{4}$ section is part of Timber Berth 391.

NE. $\frac{1}{4}$.—Rolling bench land 600 to 800 feet above the Columbia river; sandy clay loam; small spruce, fir, poplar and jackpine, a few large spruce in southeast corner; some good agricultural land if not too dry; not easily irrigated.

SEC. 26, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench lands rising from the Columbia river to an elevation of 600 feet; soil red clay loam, stony along the hillsides; small poplar, willow, fir and spruce; of no agricultural value.

NE. $\frac{1}{4}$.—Rolling bench land 400 to 800 feet above Columbia river; red clay loam; poplar, willow, fir and jackpine; slopes to southwest; some good agricultural land if not too dry; not easily irrigable.

SEC. 27, NW. $\frac{1}{4}$.—Bottom land rising to bench land; bottom land, black loam with a white clay below; poplar and willow; would make good hay land if drained; bench land of no value; $\frac{1}{4}$ section is badly broken by channels of the Columbia river.

SW. $\frac{1}{4}$.—Bottom land rising to bench land almost 600 feet above the Columbia river; bench lands stony; spruce and fir to 16 inches diameter; land of no agricultural value; bottom land rises to about 100 feet above river; almost 15 acres in northeast corner low and swampy; good hay land if drained.

NE. $\frac{1}{4}$.—Bottom land in southwest corner low and swampy, with poplar and willow; soil, black loam with white clay below; would make good hay land; most of $\frac{1}{4}$ section is broken by channels of the Columbia, but there is about 40 acres in southwest corner on the mainland.

SE. $\frac{1}{4}$.—Bottom land rising to an elevation of 100 feet above the Columbia river; clay loam, stony in places; poplar, willow, cottonwood and birch; good agricultural land.

SEC. 28, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land rising to an elevation of 800 feet; soil very stony; small spruce, fir, poplar and willow of no value; land of no agricultural value.

SEC. 32, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land, elevation 600 to 1,000 feet; soil stony; small spruce, fir, jackpine, willow and poplar; of no agricultural value.

SEC. 33, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough bench land, elevation from 300 to 600 feet; soil stony; jackpine, poplar, spruce and fir to 16 inches diameter; of no agricultural value.

NE. $\frac{1}{4}$.—Bottom land badly broken by channels of Columbia river; soil, black loam with clay subsoil, very wet; thick willow bush and alder; about twenty acres would make good hay land if drained.

SE. $\frac{1}{4}$.—Bottom land rising to bench land; bench land stony; spruce and fir up to 16 inches diameter; land of no value; bottom land black loam with clay subsoil; poplar and willow bush; about twenty acres good hay land if drained.

SEC. 34, NW. $\frac{1}{4}$.—Bottom land; soil, clayey loam; spruce, poplar and willow; would make good hay land; $\frac{1}{4}$ section is on an island in the Columbia river.

SW. $\frac{1}{4}$.—Bottom land; soil, black loam with clay below; spruce, poplar and willow; would make good hay land; $\frac{1}{4}$ section is badly broken up by channels of the Columbia river and is swampy.

NE. $\frac{1}{4}$.—Bottom land and bench land; bench land very rough and of no value unless for pasture; bottom land clayey loam, swampy; spruce, poplar and willow; would make good hay land; $\frac{1}{4}$ section is broken by the railroad and a channel of the Columbia river.

SE. $\frac{1}{4}$.—Bottom land; clayey loam, swampy; spruce, poplar and jackpine; would make good hay land; $\frac{1}{4}$ section is broken by channels of the Columbia river, and nearly all land in it is situated on an island.

SEC. 35, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land rising from the railroad to an elevation of 850 feet; soil, red sandy clay loam; small fir, jackpine, poplar and willow; all the section except a few small benches is very rough; it would make good pasture land.

SEC. 36, NW. $\frac{1}{4}$.—Rough bench land, elevation 800 to 1,200 feet; red clay loam, stony in places; poplar, willow, small fir and jackpine; would make grazing land.

SW. $\frac{1}{4}$.—Rolling bench land; elevation 700 to 900 feet; soil, red clay loam; poplar, willow, small fir and jackpine; some of benches would make good agricultural land, and remainder would make grazing land.

NE. $\frac{1}{4}$.—Very rough bench land rising to the mountains, elevation from 1,000 feet up; clay loam, very stony; small poplar, willow and fir; land is of no value.

SE. $\frac{1}{4}$.—Rough bench land from 800 to 900 feet above the Columbia valley; soil, red clay loam, rocky to northeast; poplar, willow, jackpine and fir; would make grazing land.

P. B. Street, D.L.S., 1910.—The town of Golden is situated in this township and wagon roads run in every direction. The soil varies from a sandy loam on the ridges to a clay loam on the flats near the Columbia river. Small fruits can be successfully raised, and general farm crops are also successful. Fall wheat has also been grown. There is considerable flat land along the river, extending from 10 to 80 chains from the river bank. Thence there is a rise of 500 feet to a fairly level bench which varies from half a mile to three miles in width. On the eastern limit of the bench lands the mountains rise abruptly. The Columbia river divides this township. The land on the western side is comprised in a timber limit. Not much timber of value is left on the eastern side of the river, the settlers having logged it off or cut it for fuel. Some good hay lands occur along the Columbia river, but the quality of the hay is somewhat impaired by the mud deposited by the overflow of the river. Numerous small creeks or rills rise from various springs. Hospital creek flows through sections 25, 24, 14 and 13. Considerable water-power might be developed on this creek, but the water rights are held by a local syndicate not inclined to develop them. The climate is much like that of Alberta in summer, and is too dry for successful farming without irrigation. There is considerable snow in winter. Fuel, such as fir, birch and spruce, is plentiful. No minerals are being mined in this township and none of economic value have been found. Hares and partridges are numerous, and deer were frequently seen.

Tp. 28, R. 22, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 3, SW. $\frac{1}{4}$.—Bottom land broken by channels of the Columbia river; black and red loam, inclined to be swampy; spruce up to 12 inches in diameter, with poplar and willow underbrush; would make good hay land.

SEC. 4, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ sections broken by the Columbia river and its channels; very wet and swampy; would make good hay land if drained.

NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough bench land rising from the Columbia river to 600 feet

above; red clay; jackpine, poplar and willow, with some spruce and fir; of no agricultural value unless for pasture.

SEC. 5, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 600 to 800 feet above the Columbia river; red clay with stony ridges; jackpine and poplar, with some fir and spruce; NW. $\frac{1}{4}$ and SW. $\frac{1}{4}$ badly broken, and of no use except for pasture. There is some good land in the NE. $\frac{1}{4}$ and SE. $\frac{1}{4}$.

SEC. 6, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Very rough bench land 600 to 1,000 feet above the Columbia river; red clay, very stony; some large spruce and fir with some poplar and jackpine; of no agricultural value.

SEC. 7, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 700 to 800 feet above the Columbia river; sandy clay, stony; thick jackpine and poplar; some good agricultural land to east side; the west side of both $\frac{1}{4}$ sections is badly broken.

NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land 800 to 1,000 feet above the Columbia river; red clay, very stony; spruce and fir up to 20 inches in diameter, with some hemlock and cedar; land of no agricultural value.

SEC. 8, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land rising from the Columbia river to 750 feet above; red sandy clay; jackpine and poplar, with some small spruce and fir. NE. $\frac{1}{4}$ and SE. $\frac{1}{4}$ very rough and of no use except for pasture. Some good agricultural land in the NW. $\frac{1}{4}$ and SW. $\frac{1}{4}$.

SEC. 9, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bottom land broken by the Columbia river and its channels; clay loam, very wet and swampy; would make good hay land if drained.

SW. $\frac{1}{4}$.—Rough bench land rising to 600 feet above the Columbia river; red clay, stony; jackpine and poplar, with some small fir and spruce; too rough for anything but grazing land.

SEC. 17, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ sections, broken by the Columbia river; bottom land clay loam, very wet and swampy; would make good hay land if drained; there is some rough bench land in the southwest corner of the SE. $\frac{1}{4}$.

NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land rising from the Columbia river to 500 feet above; red clay with much stone; poplar and jackpine, some willow and small spruce and fir; there is some good agricultural land through $\frac{1}{4}$ sections.

SEC. 18, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 500 to 700 feet above the Columbia river; red sandy loam, very stony; jackpine, poplar and willow, with some small spruce and fir; some fair agricultural land; the NE. $\frac{1}{4}$ is badly broken by a deep canyon.

NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land 700 to 1,000 feet above the Columbia river; red clay, very stony; poplar and jackpine, with some small spruce and fir, some large spruce and fir to west; very little land of any agricultural value.

SEC. 19, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land rising from the Columbia river to 800 feet above; red clay, very stony; poplar, jackpine, small spruce and fir, with some large spruce and fir to west; some good land in the NW. $\frac{1}{4}$ and SW. $\frac{1}{4}$.

SEC. 20, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ sections, broken by the Columbia river. All land to east of the river is disposed of. On the west there is some bottom land, black and red loam; swampy; would make good hay land if drained.

SW. $\frac{1}{4}$.—Bottom land and bench land; bench land very rough, would make pasture land; some very wet bottom land to northeast, which would make good hay land if drained.

SEC. 29, SW. $\frac{1}{4}$.—Bottom land only few feet above the Columbia river; clay loam, wet in places; open, with poplar and willow brush; good agricultural land.

SEC. 29, NW. $\frac{1}{4}$; SEC. 30, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ sections, broken by the Columbia and Blaeberry rivers; bottom land only a few feet above the Columbia river; clay loam; spruce, poplar and willow; good agricultural land. SW. $\frac{1}{4}$, fractional $\frac{1}{4}$ section, broken by the Columbia river; rough bench land rising from the river to 500 feet above; red clay, stony; large spruce and fir, with some cedar and hemlock; some good land in southwest corner.

SEC. 31, SW. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section; bottom land a few feet above the Columbia river; spruce swamp, with poplar and willow bush; good agricultural land if drained.

TP. 28, R. 23, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 24, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land 800 to 1,000 feet above the Columbia river; red clay loam, much of it very stony; large spruce and balsam with cedar and hemlock underbrush; there is some fair land to northeast, but most of it is too rough to be of much value.

SEC. 25, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land rising from near the Columbia river to 1,000 feet above; red clay, very stony in places; spruce, with some cedar, balsam and hemlock; the best timber has been cut off; there is some good land, particularly in the NW. and SW. quarters; the NE. $\frac{1}{4}$ is fractional, and broken by steep slopes to a channel of the Columbia.

SEC. 26, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Rough bench land 400 to 900 feet above the Columbia river; red clay, much of it very stony; spruce, with some cedar, balsam and hemlock; most of the good timber has been taken off; land of very little value except for pasture.

SEC. 34, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land 600 to 1,000 feet above the Columbia river; red clay, very stony; large spruce and cedar, with some fir and hemlock; nearly all too rough for cultivation; would make pasture land.

SEC. 35, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land 400 to 1,000 feet above the Columbia river; red clay, very stony; large spruce with hemlock and cedar; good timber in SW. $\frac{1}{4}$; most of land is too rough to be of any value except for pasture.

NE. $\frac{1}{4}$.—Rough bench land rising to 400 feet above the Columbia river; red clay; small spruce, fir and cedar; good timber has been cut off; there are a few acres of good bottom land in the northeast corner, but the bench land is useless except for pasture.

SEC. 36, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bottom land all low and inclined to be swampy; black and red loam; spruce, with poplar and willow brush; would make good hay land; there are several small channels of the Columbia running through the section, and the northeast corner of the NE. $\frac{1}{4}$ is cut off by main channel.

SEC. 36, S.W. $\frac{1}{4}$.—Bottom land and rough bench land rising to 400 feet above the Columbia river; bench land too rough for cultivation; bottom land black loam, swampy; spruce up to 18 inches in diameter, with poplar and willow brush; would make good agricultural land.

TP. 29, R. 23, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 1, SW. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section, broken by the river; low bottom land; clay loam, wet in places; spruce swamp, with poplar and willow brush, spruce to 12 inches in diameter; good agricultural land.

SEC. 2, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Low bottom land, much of it swampy; clay loam; spruce up to 12 inches in diameter, with poplar and willow brush; would make good agricultural land. The $\frac{1}{4}$ sections are broken by some small channels of the Columbia river. There are some large spruce and cedar in the southwest corner of the NW. $\frac{1}{4}$.

SW. $\frac{1}{4}$.—Rough bench land rising from near the Columbia river to 600 feet above; red clay loam, very stony; cedar, with some spruce and fir; thick undergrowth of small fir and cedar; land of no agricultural value except for pasture; there is a small area of bottom land in the northeast corner.

SEC. 3, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 4, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land rising from near the Columbia river to 800 feet above; red clay mixed with gravel; large spruce and cedar, with some fir and hemlock; some fair agricultural land, but most of it is very rough.

SEC. 8, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 7, NE. $\frac{1}{4}$.—Rolling bench land 400 to 1,000 feet above the Columbia river; red clay loam mixed with gravel, much of it very stony; large spruce and fir, with some hemlock and cedar; there is some fair agricultural land along the north, but most of it is very rough.

SEC. 10, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bottom land rising to about 50 feet above the Columbia river; red clay loam; poplar, birch and willow brush, with some spruce; good agricultural land.

SEC. 10, SW. $\frac{1}{4}$; SEC. 9, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land rising from near the Columbia river to 800 feet above; red clay mixed with gravel, stony in places; spruce, fir, hemlock and cedar, some large spruce and fir; some fair agricultural land, but much of it is too rough for cultivation.

SEC. 11, SE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section, broken by channels of the Columbia river; poplar, birch and willow brush, with some small spruce; would make good agricultural land.

SEC. 16, SE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section, broken by the Columbia river; bottom land rising to 50 feet above river; red clay loam; poplar and willow, with some spruce; would make good agricultural land.

SW. $\frac{1}{4}$.—Bench land rising from the Columbia river to 500 feet above; red clay loam mixed with gravel; small fir, jackpine and spruce; it is nearly all too rough for cultivation.

SEC. 17, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 18, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land rising from the Columbia river to 800 feet above; red clay mixed with gravel, stony in places; large spruce and fir, with small hemlock, spruce and cedar; some good agricultural land, but most of it is badly broken.

SEC. 20, SW. $\frac{1}{4}$; SEC. 19, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land rising from the Columbia river to 500 feet above; red clay loam, very stony; old brule with much windfall, some small spruce and fir; most of land is too rough for cultivation; would make pasture land.

Tp. 30, R. 23, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 5, NW. $\frac{1}{4}$.—Rough bench land 600 feet to 1,000 feet above the Columbia river; red clay, much of it very stony; poplar, willow and jackpine; southwest part would make good pasture land, but northeast part is very rough. Marl creek flows through the $\frac{1}{4}$ section.

SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land 500 to 600 feet above the Columbia river; red clay loam; poplar, willow and jackpine; would make good agricultural land; the north part of the SE. $\frac{1}{4}$ is badly broken and rocky.

SEC. 6, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 400 to 800 feet above the Columbia river; red clay loam, stony in places, particularly in the NE. $\frac{1}{4}$; small spruce, fir, jackpine, poplar and willow; would make good agricultural land if not too dry; it could not be irrigated easily.

SEC. 7, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land 700 to 1,100 feet above the Columbia river; red clay loam; small spruce, jackpine and poplar; good agricultural land, if not too dry; the northeast part of the NE. $\frac{1}{4}$ is rough and stony.

NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land 800 to 1,200 feet above the Columbia river; red clay, very stony in places; small spruce, fir, poplar and jackpine, some large spruce along the east side; most of the land is too rough for cultivation, but would make pasture land.

Tp. 29, R. 24, W. 5th Mer. *M. P. Bridgland, D.L.S., 1909.*

SECS. 21, 22, 23, 24, 26, 27, 28, 29 AND 30, LYING SOUTH OF THE COLUMBIA RIVER.—Rough land consisting of very steep slopes and rough rock benches 600 to 800 feet above the Columbia, red sandy clay with much stone and rock, chiefly old brulé overgrown with willow brush and small jack pines, no timber value, of no use for agricultural purposes.

Tp. 30, R. 24, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 1, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 300 to 700 feet above the Columbia river; red clay loam; small spruce, fir; jackpine and poplar; would make good agricultural land if not too dry, it could not be easily irrigated.

SEC. 2, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land, badly broken by canyons of the Bluewater and Blackwater creeks; very stony; spruce, fir and jackpine; of no agricultural value.

NW. $\frac{1}{4}$.—Bench land 400 feet above the Columbia river; red clay loam; large spruce and fir; good agricultural land in northeast part; the southeast is very badly broken by the canyon of the Blackwater.

NE. $\frac{1}{4}$.—Bench land about 400 feet above the Columbia river; red clay loam; small poplar and jackpine; some good agricultural land if not too dry; $\frac{1}{4}$ section badly broken by canyon of Bluewater.

SEC. 9, NE. $\frac{1}{4}$.—Bench land about 450 feet above the Columbia river; red clay loam; large spruce and fir; northeast part would make good agricultural land, but the southwest is broken by steep hills; there is a large beaver meadow in the northeast.

SEC. 10, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Bench land 400 to 600 feet above the Columbia river; red clay loam mixed with gravel; large spruce and fir, with small fir and jackpine to northeast; northeast corner is rough, but most of the $\frac{1}{4}$ sections would make good agricultural land.

SE. $\frac{1}{4}$.—Bench land 400 feet above the Columbia river; red clay loam mixed with gravel; large spruce and fir, with some cedar; the northeast part would make good agricultural land, but the southwest is broken by the Blackwater and the ridge beyond.

SEC. 11, SW. $\frac{1}{4}$.—Bench land about 400 feet above the Columbia river; red clay loam with gravel; large spruce and fir, with thick undergrowth; the greater part of the $\frac{1}{4}$ section would make good agricultural land.

NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Very rough bench land, badly broken by the canyon of the Bluewater; there is only a small strip along the east side of the $\frac{1}{4}$ section of any agricultural value; the bench is clay loam covered with poplar, small fir and jackpine; would make good agricultural land.

SEC. 12, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 500 to 900 feet above the Columbia river; red clay loam; poplar, willow and small spruce, fir and jackpine; would make good agricultural land if not too dry; there are some beaver ponds and meadows through the section, but it could not be easily irrigated.

SEC. 13, SW. $\frac{1}{4}$.—Rolling bench land 650 to 850 feet above the Columbia river; red clay loam; small spruce, fir, jackpine and willow; good agricultural land if not too dry.

NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land, broken by a rocky ridge to northeast; bench land 700 to 900 feet above the Columbia river; red clay loam; poplar, willow, small fir, spruce and jackpine; good agricultural land in the southwest of both $\frac{1}{4}$ sections.

SEC. 14, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Very rough bench land rising to about 1,000 feet above the Columbia river; very badly broken by the canyon of the Bluewater; large spruce and fir up to 18 inches, with small spruce and jackpine; of no agricultural value.

SEC. 15, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land 400 to 900 feet above the Columbia river; red clay loam with gravel, stony in places; large spruce and balsam with small hemlock and cedar; some good agricultural land on west side, but very rough on the east side.

SEC. 16, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land 450 to 800 feet above the Columbia river; red clay, some black loam along the Blackwater; large spruce and fir; good agricultural land; there are some large beaver meadows along the Blackwater covered with a thick growth of small willows.

SEC. 17, NE. $\frac{1}{4}$; SEC. 16, SW. $\frac{1}{4}$.—Bench land about 500 feet above the Columbia river; red clay loam; large spruce and fir; the northeast of each $\frac{1}{4}$ is nearly level and would make good agricultural land, but the southeast is broken by steep hills.

SEC. 19, NW $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land broken by steep hillside to southwest, bench land about 700 feet above the Columbia river; large fir and spruce and small hemlock; there is some good agricultural land in the northeast portion of each quarter section.

NE. $\frac{1}{4}$.—Bench land 600 to 700 feet above the Columbia river; red clay loam, with some black loam in swamps; large spruce and fir, with willow brush in swamps; would make good agricultural land.

SEC. 20, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 500 to 850 feet above the Columbia valley; red clay mixed with gravel in places; large spruce and fir, with small spruce, hemlock and cedar; good agricultural land; the northeast $\frac{1}{4}$ is all in the benches 100 to 300 feet above the Blackwater, and the southwest part of the SW. $\frac{1}{4}$ is rather rough; there is a strip of level land about $\frac{1}{4}$ -mile in width along the banks of the Blackwater.

SEC. 21, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 650 to 1,000 feet above the Columbia valley; red clay, stony in places; large spruce and fir, with an undergrowth of small spruce, fir, hemlock and cedar; good agricultural land; part of the NE. $\frac{1}{4}$ is rough and stony.

SEC. 22, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 800 to 1,000 feet above the Columbia river; red clay loam, very stony; large spruce, fir and pine, with undergrowth of hemlock and cedar; some good land, mostly in SW. $\frac{1}{4}$.

SEC. 28, SW. $\frac{1}{4}$.—Rolling bench land about 900 feet above the Columbia river; red clay loam with gravel; large spruce and fir, with some pine, undergrowth of small spruce, hemlock and cedar; good agricultural land.

SEC. 29, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land 800 to 1,200 feet above the Columbia river; red clay loam with some gravel; large fir and spruce, with small hemlock, spruce, cedar and balsam; good agricultural land; the north part of the NE. $\frac{1}{4}$ rather rough and stony.

SEC. 30, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Bench land 800 to 1,000 feet above the Columbia river; red clay loam with much gravel; spruce and fir, with some pine, thick undergrowth of small cedar and hemlock; good agricultural land.

SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 500 to 700 feet above the Columbia river; red clay loam with some gravel; spruce, balsam, with some cedar and much willow brush; good agricultural land, especially the SE. $\frac{1}{4}$.

SEC. 31, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land 700 to 900 feet above the Columbia river; red clay loam with a good deal of gravel; large spruce and fir with small hemlock, spruce and cedar; would make good agricultural land.

NE. $\frac{1}{4}$.—Rough bench land 700 to 1,100 feet above the Columbia river; red clay loam, very stony in places; hemlock, with small spruce and fir; would make pasture land; the east side is broken by steep slopes of the mountain.

Tp. 31, R. 24, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 6, SW. $\frac{1}{4}$.—Bench land, broken to northeast by steep slopes of the mountain; bench land 800 to 900 feet above the Columbia river; red clay loam; large spruce and fir, with some cedar and hemlock; good agricultural land.

Tp. 29, R. 25, W. 5th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 5, E. $\frac{1}{2}$.—Level land lying in the bottom of the Beaver valley about 200 feet above the Columbia river, soil chiefly sand and gravel, old brulé with poplar and willow brush, steep mountain slopes on both east and west sides, land broken by Mountain creek and the Beaver river, poor but might be of some value as farm land.

SEC. 8, E. $\frac{1}{2}$.—Level land in bottom of the Beaver valley about 190 feet above the Columbia, soil clay loam much sand and gravel, much spruce, poplar and willow,

would probably make good hay land, east half of quarter-sections is broken by steep mountain slopes.

SECS. 17 AND 18.—A narrow strip of rather rough bench land along boundary between the two sections, 180 to 300 feet above the Columbia, sandy clay with stone in places, of very doubtful agricultural value. In sec. 17, remainder is steep slopes with old brulé and in sec. 18 lower slopes are old brulé with some spruce and balsam on higher slopes.

SEC. 19, SE. $\frac{1}{4}$.—Chiefly steep timbered hillside. There is a narrow strip of land along Six-mile creek about 190 feet above the Columbia river, soil sandy clay, gravel in places, poplar and willow with some spruce and balsam, possible timber value, would make hay land but of doubtful value for other purposes.

SEC. 25.—Rough rolling bench land rising to about 1,000 feet above the Columbia, sandy clay, rocky, old brulé, no timber value, no agricultural value.

SEC. 34, S. $\frac{1}{2}$, SOUTH OF RAILROAD.—Rather steep slopes rising to about 600 feet above the Columbia valley, soil sandy clay, very stony, old brulé, no timber value, no agricultural value, a few acres of swamp in NE. corner would make grazing land.

SEC. 34, NE. $\frac{1}{4}$.—Steep rough hillside west of Beaver river. East of Beaver, bottom land 10 feet above the Columbia, some of it very swampy, sandy clay and loam, poplar and willow brush, farm land 70 per cent.

SEC. 35, S. $\frac{1}{2}$, SOUTH OF RAILROAD.—Almost level, bottom land rising to about 70 feet above the Columbia, red sandy clay, very stony in places and very dry, poplar, willow and jack pine, 70 per cent farm land, apparently very dry but could be easily irrigated from Quartz creek.

PART NORTH OF COLUMBIA RIVER.—A strip of bottom land 10 to 15 chains wide along the bank of the Columbia river and 5 to 15 feet above, clay loam, swampy in places, poplar, willow and alder, good farm land 90 per cent. Remainder of section to NE. is steep rocky slopes covered with small fir and jack pine.

SEC. 36, NORTH OF RAILROAD.—Steep rocky slopes covered with small fir and jack-pine, no timber value and of no agricultural value.

Tp. 30, R. 25, W. 5th Mer. M. P. Bridgland, D.L.S., 1909.

SEC. 3, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 9, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 10, SW. $\frac{1}{4}$; SEC. 16, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 20, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 21, SW. $\frac{1}{4}$, WEST OF COLUMBIA RIVER.—Low bottom land extending back to steep timbered mountain slopes, soil sandy clay loam, rather wet and swampy, spruce, cedar and cotton wood with much poplar and willow brush, in places timber value. Land could be drained and would make good farming land, value about 80 per cent. In middle of boundary between sec. 9 and sec. 16 there is a small lake. NW. $\frac{1}{4}$ sec. 3, SE. $\frac{1}{4}$ sec. 9, SW. $\frac{1}{4}$ sec. 16 and SE. $\frac{1}{4}$ sec. 20 are broken in SW. corners by steep timbered mountain slopes, other quarters broken by the Columbia river.

SEC. 29, WEST OF COLUMBIA RIVER.—Bottom land very little above the Columbia river, swampy and partially flooded at high water, soil sandy clay loam, spruce, cedar and balsam with willow brush in places, lumber value. There is a large swamp in NW. $\frac{1}{4}$ and SW. $\frac{1}{4}$ of section, partially open with willow brush, and some channels of the river also flow through the section, mixed farm lands and grazing land, land is broken in the west side by steep timbered mountain slopes.

SEC. 31, E. $\frac{1}{2}$ of NE. $\frac{1}{4}$ AND SE. $\frac{1}{4}$; SEC. 32, WEST OF COLUMBIA RIVER.—Low bottom land subject to flooding at high water, most of land very wet and swampy, spruce cedar and hemlock to 2 feet diameter, lumber value, clay loam. In central part extending into E. $\frac{1}{2}$ of sec. 31 and W. $\frac{1}{2}$ of sec. 32, there is a large swamp open with willow brush in places; part of it would make farm land and part grazing land.

SEC. 25, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land, broken by steep slopes of ridge to southwest; bench land is 600 to 700 feet above the Columbia river; red clay, very stony in many places; some large spruce, with small fir and hemlock; most of

the land is too rough for anything but pasture; there is a narrow strip of good land along the banks of the Blackwater in the SE. $\frac{1}{4}$ and the NE. $\frac{1}{4}$.

SEC. 36, SW. $\frac{1}{4}$.—Rough bench land 600 to 900 feet above the Columbia river; red clay, stony in places; large spruce and fir, with hemlock, cedar and balsam; too rough for anything but pasture land.

NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Nearly level bench land 650 to 850 feet above the Columbia river; red clay loam with some gravel, stony in places; large spruce and cedar, with hemlock and balsam; would make good agricultural land. The NW. $\frac{1}{4}$ is broken by a branch of the Blackwater.

Tp. 31, R. 25, W. 5th Mer. *M. P. Bridgland, D.L.S., 1908.*

SEC. 1, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 700 to 1,000 feet above the Columbia river; red clay loam, very stony on the ridges; some large spruce, with small fir, hemlock and cedar; the SW. $\frac{1}{4}$ has been burned; good agricultural land.

SEC. 2, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough bench land 700 to 900 feet above the Columbia river; red clay, stony in places; large spruce and fir, with small balsam and hemlock; would make pasture land; the SE. $\frac{1}{4}$ is broken by one of the lakes on the Blackwater creek.

M. P. Bridgland, D.L.S., 1909.—SEC. 4, W. $\frac{1}{2}$.—Low bottom land chiefly islands lying between channels of the Columbia river, light clay sand and gravel overgrown with willow brush, farm land 40 per cent. The east channel of the river runs along the base of steep rock hills covered with brulé.

SEC. 5, E. $\frac{1}{2}$.—Bottom land rising gradually back from the river till about 40 feet above at base of mountain, soil clay loam, spruce, poplar and willow, open at places, lumber value, some excellent farm land in NE. $\frac{1}{4}$, would class about 90 per cent, SE. not as good soil and broken on the east by the river and in the west by the mountains.

SEC. 8; SEC. 17, SW. $\frac{1}{4}$.—Bottom land low and wet partially flooded in high water and broken by the Columbia river and its channels. In the NE. and SW. corners it is broken by steep mountain slopes especially in SW. $\frac{1}{4}$ of sec. 8. Soil, sandy clay loam, timber chiefly spruce running up to 2 feet diameter, lumber value, would make good farm land if drained, per cent value about 70.

SEC. 18, SE. $\frac{1}{4}$.—Low bottom land rising to 15 feet above the Columbia, swampy in places, $\frac{1}{4}$ section is broken in the east by Columbia river and channels and on the west by steep timbered slopes of mountain, clay loam with spruce and cedar to 2 feet, lumber value. A narrow strip along the river would probably make good farm land, value about 70 per cent.

SEC. 18, NE. $\frac{1}{4}$; SEC. 19, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Fractional quarters broken by the Columbia river, low bottom land wet and swampy in high water, sandy clay loam, spruce up to 2 feet diameter, willow and alder, lumber value, good hay land and might make good farm land if drained, value 70 per cent. The NE. $\frac{1}{4}$ of 19 is broken on the west by steep rocky slopes.

SEC. 19, W. $\frac{1}{2}$.—Bottom land, low swampy meadows covered with water and badly broken by sloughs and the Columbia river, mostly open, grazing land.

SEC. 29; SEC. 30, E. $\frac{1}{2}$.—Rather rough slopes rising to about 700 feet above the Columbia river, NE. part of section 29 slopes NE. to Succour creek, soil sandy clay, stony and rocky, mostly old brulé, some spruce and hemlock up to 18 inches, of very doubtful agricultural value.

SEC. 30, W. $\frac{1}{2}$.—Low swampy bottom land, the NW. $\frac{1}{2}$ broken by steep slopes and the SW. $\frac{1}{4}$ by the Columbia river, sandy clay and black loam, mostly open meadow, flooded, with some spruce, alder and willow, no timber value, grazing land.

SECS. 31 AND 32.—Chiefly rough rolling bench land rising to 500 feet above the Columbia river, sandy clay, stony and rocky, chiefly old brulé with small hemlock, spruce and balsam, some good spruce 2 feet diameter along streams, possible lumber value. The only land of any agricultural value is a narrow strip along Succour creek and along a small stream flowing through the NW. part of sec. 31.

Tp. 32, R. 25, W. 5th Mer. *M. P. Bridgland, D.L.S., 1909.*

SECS. 5, 6 AND 7.—Rough rolling bench land 80 to 500 feet above the Columbia valley, soil light clay loam, much of it very stony and rocky. The NE. halves of 7 and 5 are broken by steep rocky slopes of mountains, mostly timbered, and the SE. part of section 6 is also broken by steep timbered slopes with spruce, cedar and balsam up to 18 inches. The remainder is old brulé overgrown with small spruce, jackpine, willows, etc. There is a narrow strip of good land along Succour creek, widening out in SE. $\frac{1}{4}$ of section 6 about 80 to 120 feet above the Columbia, and a small swamp in the NW. $\frac{1}{4}$ section 7, about 80 feet above which would make good farm land; the remainder is too rough for agriculture.

SEC. 16, N. $\frac{1}{2}$.—A narrow strip of bottom land 10 to 15 chains wide, along the south side of Bush river; remainder steep rocky mountain slopes burned over and useless. Bottom land about 25 feet above the Columbia, sandy clay loam with gravel, swampy with willow brush, small spruce and jackpine in places, grazing land, 60 per cent farm land.

SEC. 17, N. $\frac{1}{4}$.—Bottom land about 20 feet above the Columbia river, open swamps and jackpine flats, soil sandy clay with much gravel; grazing land. The north side is broken by timbered slopes of the mountains.

S. $\frac{1}{2}$.—Mostly steep timbered slopes of mountain with spruce and fir to 1 foot, some bottom land along the north side chiefly in SE $\frac{1}{4}$, sandy clay loam, partially open and grassy with jack pines, grazing land, 70 per cent farm land if drained.

SEC. 18.—All rough rocky slopes of ridge from mountain, fir, spruce and hemlock, lumber value, of no use except as timber land. In the northeast corner of the section there is a small area of swampy land by Bush river suitable for grazing and possibly for farm land if drained.

SEC. 19.—Bottom land 20 feet above Columbia river, low and swampy, sandy clay with black loam, consists largely of open meadows and sloughs subject to flooding, narrow strip of small spruce, willow, etc., along river bank, no timber of value, grazing land broken by Bush river and its channels, some land might be drained to make good farm land. The NE. $\frac{1}{4}$ is not quite so wet but is more sandy and has much small spruce, jack pines and willow brush. The SW. corner of SW. $\frac{1}{4}$ is broken by steep timbered mountain slopes.

SEC. 21, SE. $\frac{1}{4}$; SEC. 22, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bottom land about 25 feet above the Columbia river, soil sandy clay and gravel flat consists chiefly of gravel bars broken by different channels of Bush river, timber mostly small spruce, jack pine and willow brush, land of very little value unless for grazing. NW. parts of SE. $\frac{1}{4}$ section 21, and NW. $\frac{1}{4}$ and SE. $\frac{1}{4}$ of section 22 are broken by steep mountain slopes.

SEC. 30, SW. $\frac{1}{4}$.—Bottom land rising gradually to about 50 feet above the Columbia valley and broken in the north by Mountain slopes, soil clay loam, stony to north, cedar and spruce to 2 feet diameter, and some poplar, lumber value, farm land 60 per cent. There is a small stream through $\frac{1}{4}$ section.

SE. $\frac{1}{4}$.—Bottom land in SW. corner about 20 feet above the Columbia valley, sandy clay and black loam, open with scattered willow brush, etc., grazing land. Would make good farm land if drained, most of $\frac{1}{4}$ is broken by steep mountain slopes with spruce, cedar, etc.

Tp. 31, R. 26, W. 5th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 24, NE. $\frac{1}{4}$.—Bottom land in NE. corner broken in SW. by steep rocky slopes. Bottom land, clay loam, mostly open swampy meadow, some spruce where not flooded, grazing land, some would be suitable for farming if drained.

SEC. 25, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Fractional quarters broken by the Columbia river, chiefly low swampy meadows with willow brush spruce along bank of river, possible lumber value, sandy clay loam. Spruce swamp in south part of SE. quarter would probably make farm land if drained, value 70 per cent, remainder grazing land.

SEC. 25, NW. $\frac{1}{4}$; SEC. 26, NE. $\frac{1}{4}$.—Low swampy bottom land mostly flooded, sandy clay and black loam, poplar, willow and spruce along river bank, no lumber value, mostly open with willow brush and badly broken by a large slough, grazing land, half NE. $\frac{1}{4}$ of 26 is broken by steep rocky timbered slopes.

SEC. 33, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Bottom land rising to steep timbered slopes of mountain, bottom land a strip about 15 chains wide along north side of section, sandy clay and black loam, open meadow with scattered willow brush, very wet, grazing land, might make farm land if drained.

SEC. 34; NE. $\frac{1}{4}$, NORTH OF COLUMBIA.—Bottom land, low and swampy, sandy clay and black loam, timber, some large spruce along river bank, mostly open with willow brush, grazing land.

SEC. 35, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, S.E. $\frac{1}{4}$, NORTH OF RIVER.—Low bottom land, sandy clay and black loam, swampy with scattered willow brush, a few spruce along bank of river, grazing land NE. part of NE. $\frac{1}{4}$ is broken by steep rocky slopes covered with old brûlé and SE. $\frac{1}{4}$ is broken by the Columbia river.

SEC. 36, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Chiefly steep rocky slopes, old brûlé of no value, some low swampy meadows on the south, open with willow brush, suitable for grazing.

N. $\frac{1}{2}$.—A rolling rocky ridge about 50 feet above the Columbia, sandy clay, rock and stone, old brûlé, no timber, of no agricultural value.

Tp. 32, R. 26, W. 5th Mer. *M. P. Bridgland, D.L.S., 1909.*

SECS. 1 AND 2.—Rough land rising from level of Columbia to about 500 feet above and then sloping north east to Succour creek, soil sandy clay, very rocky especially to south and on slopes facing the Columbia, chiefly old brûlé, some hemlock, spruce and cedar up to 1 foot on top and on slopes to Succour creek, mostly in sec. 1, possible timber value, no agricultural value. Some grazing land in SW. $\frac{1}{4}$ sec. 2.

SECS. 3 AND 4; SEC 5, E. $\frac{1}{2}$.—Bottom land, low and wet, broken by the Columbia river, Gold creek and some small sloughs, sandy clay and black loam, spruce up to 2 feet diameter along river and in strips through meadows, possible lumber value, meadows more or less open with willow and alder grazing land, some land suitable for farming, any land that could be drained would make good farm land.

SEC. 5, W. $\frac{1}{2}$.—Bottom land, low and wet in high water, sandy clay loam, spruce up to 2 feet diameter with much willow and alder, lumber value, would make good farm land if drained.

SEC. 6, E. $\frac{1}{2}$; NORTH OF GOLD CREEK; SEC. 7, S. $\frac{1}{2}$.—Bottom land, some of it swampy during high water, soil very sandy, coarse grains of rock and mica, poplar, birch, willow, alder and small spruce, no timber value, would make farm land, value 60 per cent.

SEC. 7, N. $\frac{1}{2}$; SECS. 8 AND 9.—Low wet bottom land, west $\frac{1}{2}$ sec. 9, broken by the Columbia river, soil sandy clay and black loam, large spruce along river bank, possible lumber value, mostly open meadows swampy with willow, alder and small spruce in places, large slough in NE. $\frac{1}{4}$ sec. 8, chiefly grazing land, some of it might be suitable for farming, particularly along the banks of the river.

SECS. 10, 11, 12, 13 AND 14; SEC. 15, SE. $\frac{1}{4}$.—Rough rolling land rising from level of the Columbia river to 800 feet above, soil red sandy clay, mostly stony, mostly hemlock with some spruce, fir balsam up to 18 inches diameter, possible lumber value. Wherever burned over the land appears very stony and rocky and most of it is of very doubtful agricultural value; water is scarce, and much of it would be very difficult to irrigate. There is a narrow strip of good land along valley of Succour creek and some good benches in NW. $\frac{1}{4}$ of sec. 13 and NE. $\frac{1}{4}$ sec. 14.

SEC. 15, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$; SECS. 16, 17 AND 18; SEC. 19; fractional SW. $\frac{1}{4}$.—Bottom land, low and swampy broken by Columbia river, Bush river and some small slough and beaver ponds, soil sandy clay and black loam, spruce, cottonwood and cedar, two feet diameter along banks of river and in strips through swamps, lumber value, mostly swamp open and grassy with willow brush, alder, etc., flooded in high water.

Some of land, chiefly along river banks, suitable for farming, but chiefly grazing unless drained.

SEC. 19, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 20, W. $\frac{1}{2}$.—Bottom land rising to rolling bench land up to 250 feet above the Columbia river, jack pine, spruce, fir, poplar, willow, etc., considerable spruce and fir up to 2 feet diameter, lumber value, soil sandy clay loam, would make good farm land, percentage value about 80.

SEC. 20, E. $\frac{1}{2}$.—Bottom land on east side rising to bench land 40 to 250 feet above the Columbia river on the west. West side, sandy clay loam, stony in places, some spruce and fir up to 2 feet, lumber value, farm land 70 per cent. East side, swampy meadows with willow brush, poplar, etc., liable to flooding, grazing land.

SECS. 21, 22.—Bottom land, low and swampy, flooded in high water, broken by Shell creek, Bush river and some small sloughs, sandy clay and loam, spruce up to 2 feet diameter along banks of streams, possible lumber value, chiefly meadows with much willow brush in places, some land suitable for farming but chiefly grazing land.

SEC. 23, S. $\frac{1}{2}$.—Bench land 20 to 200 feet above the Columbia river, sandy clay loam, spruce and cedar to 2 feet diameter, lumber value, 80 per cent farm land. SE. $\frac{1}{4}$ is broken on NE. by steep timbered ridge of mountain.

SEC. 23, N. $\frac{1}{2}$; SEC. 24, N. $\frac{1}{2}$.—Bottom land, all wet and swampy, partially flooded in high water, all $\frac{1}{4}$ sections broken by the Bush river, spruce, cedar, etc., up to 2 feet diameter, lumber value, sandy clay loam mixed farming land and grazing land.

SEC. 24, S. $\frac{1}{2}$.—Steep timbered ridge from mountain very rocky, fir, spruce, hemlock to 18 inches in diameter, lumber value, no agricultural value.

SEC. 25, S. $\frac{1}{2}$.—Bottom land, 10 to 20 feet above the Columbia river, soil sandy clay mixed with black loam open and swampy in places, timber, spruce and cedar up to 2 feet diameter, lumber value, grazing land when open and would probably make good farm land if drained. The north is broken by steep mountain slopes heavily timbered with spruce, fir, hemlock, etc.

SEC. 26, N. $\frac{1}{2}$.—A narrow strip of low swampy land along south side about 10 feet above the Columbia river, open and suitable for grazing, SW. corner of NW. $\frac{1}{4}$ is broken by a lake. The remainder is steep mountain slopes, timbered with fir and hemlock.

SW. $\frac{1}{4}$.—Bottom land rising to bench land about 75 feet above the Columbia river, about half of $\frac{1}{4}$ section on west broken by lake, SE. corner swampy, liable to flooding, grazing land, NE. corner broken by a rather rocky ridge with small fir, spruce, balsam, etc., no timber value, of doubtful utility.

SE. $\frac{1}{4}$.—Bottom land about 10 feet above the Columbia river, broken to north by a low wooded ridge rising about 50 feet above the Columbia valley, soil sandy loam to sandy clay, timber, small fir, spruce, etc., on ridge, most of land swampy liable to flooding, grazing land, part of ridge might be of use for farming.

SEC. 27, S. $\frac{1}{2}$; SOUTH OF LAKES.—Bottom land about 10 feet above the Columbia river, sandy clay and black loam, open meadow with some willow and poplar, subject to flooding, grazing land, good farm land if it could be drained.

N. $\frac{1}{2}$, NORTH OF LAKES.—Bottom land rising to 30 feet above the Columbia valley and then broken by steep timbered mountain slopes, soil light clay loam, timber large poplar and willow brush with some fir and spruce. The bottom land consisting of a narrow strip of land near the lakes would make farm land.

SEC. 28, NE. $\frac{1}{4}$.—Bottom land rising gradually to about 50 feet above Columbia river and then broken by steep timbered slopes of mountain on north, south side of $\frac{1}{4}$ is broken by lake, large poplar and willow, some fir, spruce and cedar, no lumber value, some good farm land in centre of $\frac{1}{4}$, a good stream through $\frac{1}{4}$ section.

SEC. 28, S. $\frac{1}{2}$, SOUTH OF LAKE.—Rolling bench land about 75 feet above the Columbia river, soil, sandy clay, stony and rocky in places, small fir, spruce, balsam and cedar, possible timber value, farm land 40 per cent value. A few acres of good grazing land on east side.

SEC. 29, E. $\frac{1}{2}$.—Rolling bench land rising to 130 feet above the Columbia river,

soil clay loam, rough in places, much small fir, spruce and jack pine with some spruce and fir up to 2 feet, timber value, farm land 50 per cent.

SEC. 29, W. $\frac{1}{2}$, SEC. 30.—Rolling bench land 55 to 200 feet above the Columbia river, soil sandy clay loam, stony in places, spruce, fir and cedar up to 2 feet, and much underbrush, willow, alder, etc., lumber value, some of land rather swampy would make good farm land, sec. 30 about 90 per cent, W. $\frac{1}{2}$ sec. 29, 70 per cent.

TP. 32, R. 27, W. 5th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 12, NE. $\frac{1}{4}$; SEC. 13, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 24, SE. $\frac{1}{4}$.—Bottom land, the west half broken by steep timbered mountain slopes, low and swampy on east, sandy clay loam, spruce up to 2 feet diameter at base of hills, lumber value, much willow brush, mixed grazing and farm lands.

TP. 20, R. 29, W. 5th Mer. *H. G. Wheeler, 1908.*

PT. SEC. 32, WEST OF RIVER.—Bench land 40 to 70 feet above river, rising back to steep mountain slopes, agricultural land suitable for farming or fruit growing, soil, clay loam, timber, hemlock and cedar to 3 feet diameter; good timber has been taken off near river, within timber berth 112.

SEC. 33, PT. W. $\frac{1}{2}$.—Bottom land and bench land rising to 100 feet above river, first-class agricultural land, suitable for farming and fruit growing. Soil, black loam with light clay subsoil, timber, some hemlock and cedar to 3 feet diameter, of lumber value, with small cottonwood and willow brush; land partly burned over in northern portion, within timber berth 114.

SEC. 28, PT. NE. $\frac{1}{4}$.—Bottom land 20 to 30 feet above river, first-class agricultural land, suitable for farming and fruit growing; soil, rich sandy loam with clay subsoil; timber, some large cedar and hemlock, of lumber value, cottonwood and willow brush, within timber berth 114.

S. $\frac{1}{2}$, EAST OF RIVER.—Bottom land 20 feet above river, first-class agricultural land, suitable for farming and fruit growing; soil, rich sandy loam with clay subsoil; timber, brûlé, with second growth of cottonwood and willow brush, within timber berth 114.

SEC. 28, WEST OF RIVER; SEC. 29, WEST OF RIVER AND NORTH OF PROVINCIAL LOTS 811 AND 5092.—Bench land 40 to 100 feet above the river, rising back to steep mountain slopes, good agricultural land, suitable for farming and fruit growing, soil, clay loam with sand and gravel subsoil, timber, hemlock and cedar to 3 feet diameter; most of good timber taken off, within timber berth 112.

T. H. Plunkett, D.L.S., 1909.—In section 29 an apple and plum orchard from ten to fifteen years old has yielded the owners splendid returns. The orchard appears to be in a healthy condition and no doubt with proper care will continue its satisfactory yield for some time. Irrigation either on the benches or bottom lands is not necessary, and summer frosts do not exist. The winters are sometimes cold, but this district has the advantage of an exceptionally heavy snowfall, which, coming before the frost has entered the ground to any considerable extent, ensures the successful wintering of orchards, keeps the ground warm and gives an important stimulus to spring growth. Columbia river is navigable throughout this district, and the Arrowhead branch of the Canadian Pacific railway, following the left bank of the river, affords excellent transportation facilities. Wagon roads have as yet not been constructed farther than 6 miles below Revelstoke. Excellent markets for farm and garden produce of all kinds are already established at Revelstoke, where the demand far exceeds the present local supply, while there is, with the present facilities for shipment to the prairies, no chance of an over-production. These fruit lands can be conveniently divided into two classes: bottom lands elevated from 10 to 50 feet and bench lands elevated from 50 to 2,000 feet above high-water mark on Columbia river. The eastern half of sec. 28 includes both classes of land. The bottom land comprises about 60

acres lying in a triangular-shaped strip along the western boundary of the east half of the section. The soil generally consists of a light clay inclined to be sandy in places, but in some portions of this land a rich black loam was found. On the northern part of this bottom land considerable fallen timber lies on the ground, but most of the merchantable wood has been removed. In the southern portion considerable timber is still standing, but here also there is considerable fallen timber, making clearing an expensive operation. When cleared and properly drained the land would be valuable for all branches of farming. Skirting this strip of bottom land on the east there rises a steep rock bluff, in places almost inaccessible, while on top of this, and extending with a fairly uniform western slope to the eastern limit of the section, lies a considerable amount of good bench land. The soil consists of a clay loam, inclined in places to be sandy or gravelly. The clearing, generally speaking, can be done cheaply, as the timber consists of small poplar, with, in places, a good deal of brush and fallen timber. In the northeast corner of the section there is some merchantable timber, consisting of cedar, hemlock and tamarack. In places there is considerable outcropping of rock, but, in part at least, this bench land could be profitably utilized for fruit raising.

G. H. Blanchet, D.L.S., 1910.—The valley of the Columbia river which crosses this township attains a width of about a mile and a half here, and is favoured by excellent conditions as to soil, climate and water supply which makes it suitable for any form of agriculture. On the western side of the river there is a heavy growth of cedar, part of which has been logged, but the eastern part has been mostly all fire-swept. No water-powers, coal nor minerals of economic value were observed. There are a few bears, deer and caribou in the township. Salmon are obtained from the river.

Tp. 21, R. 29, W. 5th Mer. *H. G. Wheeler, 1908.*

SEC. 5, FRAC. NW. $\frac{1}{4}$.—Bottom land 10 feet above river; east of sloughs traversing quarter-section land rises to 150 feet above river; west of sloughs land low; may be too moist for agriculture; east of sloughs much dryer and well suited for farming and fruit growing if drained; soil, rich vegetable mould with light clay subsoil; timber, cedar to 4 feet diameter, hemlock and a few small pine, of good lumber value, within timber berth 114.

FRAC. SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bottom land rising to 40 feet above river, good agricultural land, suitable for farming, and fruit growing; soil, sandy loam with light clay subsoil; timber scattered hemlock and cedar to 3 feet diameter, of lumber value; has been partly burned over in eastern portion, within timber berth 114.

SEC. 6, WEST OF RIVER.—Bench land 30 feet above river; a narrow strip about 10 chains wide along river bank probably suitable for farming and fruit growing; timber, cedar and hemlock; all good timber taken off; within timber berth 112. Soil, clay loam.

SEC. 7, frac. NE. $\frac{1}{4}$.—Bottom land 25 to 30 feet above river, good agricultural land, probably too moist for fruit growing; soil, sandy loam with light clay subsoil; timber north part brulé; south portion cottonwood, poplar and willow, scattered cedar to 4 feet diameter, of lumber value, within timber berth 156. Slough traverses quarter-section near east boundary; east of slough land in lower, soil, vegetable mould with sandy subsoil.

FRAC. SE. $\frac{1}{4}$.—Bottom land 15 to 20 feet above river, good agricultural land, probably too low for fruit growing; soil, clay loam with sandy subsoil; timber: scattered cedar, cottonwood and poplar, some cedar of lumber value, is now being logged by Bowman Lumber Company; south portion has been burned over and logged, within timber berth 156. Slough traverses northeast corner.

SEC. 8.—All rocky mountain side except extreme southeast corner.

PT. SW. $\frac{1}{4}$.—Southwest portion bottom land, 10 feet above river; east of sloughs traversing SW. corner land rises to 150 feet above river; west of sloughs land is low,

may be too moist for agriculture; east of sloughs much dryer and well suited for farming and fruit growing if drained, soil, rich vegetable mould with light clay subsoil, timber, cedar to 4 feet diameter, hemlock and a few small pine of good lumber value, within timber berth 156.

PT. SE. $\frac{1}{4}$.—Southeast corner bench land rises to 180 feet above river, agricultural land, suitable for farming and fruit growing; soil, sandy loam with light clay subsoil; timber, hemlock to 12 inches diameter, within timber berth 156. All except SW. corner steep rocky slopes of mountain side.

T. H. Plunkett, D.L.S., 1909.—The northeast quarter of sec. 5 and the southeast quarter of sec. 8 consist of a series of benches, the lower of which are admirably suited for fruit lands. The timber for the most part consists of small poplar and brush easily cleared, while on the first bench some cedar, hemlock and spruce from 1 to 3 feet is to be found. The soil on the first bench consists of a rich black loam, but higher up it becomes lighter, consisting of a gravelly clay loam. Separating this series of benches are somewhat steep rises on which are frequent outcroppings of rock. The northwest quarter of sec. 8, with the exception of about 40 acres of bottom lands, consists of a steep rocky bluff. This 40 acres is a rich clay loam, well suited for farming. Fractional north half of sec. 7, adjoining the above land, is also bottom land of the same rich soil. These two parcels can be used for all branches of fruit or general farming. As is characteristic of the bottom lands, the clearing will be expensive, but such expense I think is well warranted by the adaptability of the land for farming and the demand for its product. About 30 acres in the northeast quarter of sec. 1, the east half of sec. 12, 70 acres in the west half of sec. 12 adjacent to the east boundary of the west half, that portion of sec. 13 and 24 not covered by Columbia river, and small portions of the northeast quarter of sec. 14, and the east half of sec. 23 are all bottom lands admirably suited, when cleared, for raising fruit or for general farming. The soil, though inclined to be sandy, is very productive where any attempts have been made at cultivation. Small fruits were found to be of a very high order in this locality. No portion of the valley, however, presents greater difficulties for clearing the land than do the parcels mentioned above. There is here a very heavy growth of timber, consisting mostly of very large cedar and hemlock. There is, on the ground, an exceptionally large amount of fallen timber. Where lumbering operations have been carried on the conditions are not improved. The stumps of the large cedar are left standing to a height of from 10 to 15 feet, while the butt logs and the tops scattered about, make the bush almost impassable. There are no bench lands adjacent to these bottom lands, the mountain side being very steep and rocky and absolutely useless for agriculture.

G. H. Blanchet, D.L.S., 1910.—The land of agricultural value in this township is for the most part still included in timber berths which occupy most of the valley of the Columbia river. Portions of secs. 7, 8 and 18, extending back to the foothills, were surveyed. This land was mostly rough and stony, but probably suitable for fruit growing.

Tp. 21, R. 1, W. 6th Mer. *H. G. Wheeler, 1908.*

SEC. 13, W. OF COLUMBIA RIVER; SEC. 12, E. $\frac{1}{2}$, PT. NW. $\frac{1}{4}$.—Bench land 30 to 80 feet above river, good agricultural land, probably suitable for farming and fruit growing; soil, sandy clay loam with gravel subsoil; timber, hemlock and cedar to 2 feet diameter; much of good timber taken off. Within timber berth 113.

SEC. 14, NE. $\frac{1}{4}$.—Bench land rising 80 to 200 feet above river to slopes of mountain, fair agricultural land, probably suitable for farming and fruit growing; soil, sandy loam with gravel subsoil; timber, hemlock and cedar to 3 feet diameter, of lumber value, within timber berths 113 and 528.

SEC. 23, PT. NE. $\frac{1}{4}$, PT. SE $\frac{1}{4}$.—Bench land 40 to 100 feet above the river on east half of quarter-section rising back to steep slopes of mountain, good agricultural land,

THE UNIVERSITY OF CHICAGO

The first of these is the fact that the
 second of these is the fact that the
 third of these is the fact that the

1. The first step in the process of the investigation is the identification of the problem. This is done by the investigator who is responsible for the study. The next step is to collect data. This is done by the investigator who is responsible for the study. The next step is to analyze the data. This is done by the investigator who is responsible for the study. The next step is to interpret the results. This is done by the investigator who is responsible for the study. The next step is to write the report. This is done by the investigator who is responsible for the study.

1. The first of these is the fact that the Commission has not yet received any information from the Government of the United States regarding the activities of the Committee for the Liberation of the People of the East (CLPE) in the United States. This is a serious omission, as the CLPE is a well-known and active organization which has been operating in the United States for many years. It is therefore essential that the Commission be kept informed of its activities, in order that it may be able to take appropriate action to protect the interests of the United States.

THE FIRST PART OF THE BOOK IS A HISTORY OF THE
THE SECOND PART IS A HISTORY OF THE
THE THIRD PART IS A HISTORY OF THE
THE FOURTH PART IS A HISTORY OF THE
THE FIFTH PART IS A HISTORY OF THE
THE SIXTH PART IS A HISTORY OF THE
THE SEVENTH PART IS A HISTORY OF THE
THE EIGHTH PART IS A HISTORY OF THE
THE NINTH PART IS A HISTORY OF THE
THE TENTH PART IS A HISTORY OF THE

[illegible]

THE UNIVERSITY OF CHICAGO
 LIBRARY
 540 EAST 58TH STREET
 CHICAGO, ILL. 60637
 TEL. 733-4331

THE UNITED STATES OF AMERICA
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
WASHINGTON, D. C. 20250

THEY ARE NOT TO BE USED FOR ANY OTHER PURPOSES AND SHOULD BE KEPT IN THE HANDS OF THE PERSONS TO WHOM THEY ARE ISSUED.

THE UNIVERSITY OF CHICAGO PRESS

1. The first of these is the fact that the
 2.
 3.
 4.
 5.
 6.
 7.
 8.
 9.
 10.
 11.
 12.
 13.
 14.
 15.
 16.
 17.
 18.
 19.
 20.
 21.
 22.
 23.
 24.
 25.
 26.
 27.
 28.
 29.
 30.
 31.
 32.
 33.
 34.
 35.
 36.
 37.
 38.
 39.
 40.
 41.
 42.
 43.
 44.
 45.
 46.
 47.
 48.
 49.
 50.
 51.
 52.
 53.
 54.
 55.
 56.
 57.
 58.
 59.
 60.
 61.
 62.
 63.
 64.
 65.
 66.
 67.
 68.
 69.
 70.
 71.
 72.
 73.
 74.
 75.
 76.
 77.
 78.
 79.
 80.
 81.
 82.
 83.
 84.
 85.
 86.
 87.
 88.
 89.
 90.
 91.
 92.
 93.
 94.
 95.
 96.
 97.
 98.
 99.
 100.

which appears to differ in no way from that in almost all other portions of these fruit-land surveys. Except the islands in the river, probably 200 acres lying in a narrow strip along the west bank of Columbia river would include all the land suited to agriculture in sec. 27. This strip widens rapidly as it goes north on the west bank of the river and embraces the west half of sec. 34, sec. 33 with the exception of about 170 acres in the southwest corner, and the south half of sec. 4, township 22. Entering sec. 5 the strip narrows again rapidly until at the southwest corner of sec. 8 and the southeast corner of sec. 7 the amount of farming lands is extremely limited. This portion just described may be all classed as bottom lands, there being no bench lands on the west side of the river in this locality, the mountain side rising steep and rocky at the western limit of the bottom lands. The clearing, though not nearly so difficult as that for lands south, still presents considerable difficulty, the surface being fairly heavily wooded with cedar and hemlock. Sec. 34 of township 21 and sec. 4 of township 22 are inclined to be wet, being traversed many times by deep sloughs. This wet land has given rise to a somewhat heavy growth of cottonwood, with very heavy brush. Excellent farming and fruit lands exist also on the east side of the river in the south half of sec. 34, the southwest corner of sec. 35 and the northwest quarter of sec. 26. This part pertains to the nature of a plateau, being slightly elevated above the river, but not to a sufficient extent to, in any way, affect its agricultural value. These may also be classed as bottom lands. The soil, as usual, consists of a sandy clay. The clearing on these lands is comparatively easy, the prevailing wood being small poplar and brush, with some fallen timber.

G. H. Blanchet, D.L.S., 1910.—The Columbia river crosses this township from north to south and is navigable for crafts of shallow draught. The Arrow Lake branch of the Canadian Pacific railway follows the eastern bank of the river and the station of Wigwam is situated in sec. 26. The lands of agricultural value are those portions of the river valley not occupied by the river, being the river branches and the lower slopes of the adjacent mountain. The soil varies from a sandy to a rocky clay loam and appears to be best adapted to garden produce, hay and grain. The township has been heavily timbered, principally with cedar, but the more accessible trees are being rapidly converted into lumber. Streams are numerous. The principal one is Akolkolex river, which flows through secs. 35 and 27 into the Columbia river. Along this creek in the southeastern quarter of sec. 35 there is a waterfall which is capable of developing considerable power. The summers are very warm and the winters mild, but frosts sometimes occur in early September. No coal, lignite nor minerals of economic value were observed. A few bears, deer and caribou range on the higher slopes of the mountains, and salmon are obtained from the river.

Tps. 21 and 22, R. 1, W. 6th Mer. *C. H. Taggart, D.L.S., 1911.*

The land in the sections retraced, lying west of the river, is mostly level, and the timber has been taken off recently. The soil is a sandy loam and is suitable for raising hardy vegetables. Good water can be secured everywhere, either from the Columbia river or from the small streams flowing into it. Wood of all kinds is available for fuel, but no coal nor lignite veins were seen. There is no hay. No stone-quarries nor minerals of value were seen. No summer frosts are experienced throughout the valley. Plenty of rain falls as a general rule and indications are that crops will mature without irrigation.

Tp. 22, R. 1, W. 6th Mer. *T. H. Plunkett, D.L.S., 1909.*

The south half of sec. 8 contains a considerable amount of first-class cedar and hemlock timber, which does not as yet appear to have been cut over. The northern half of the section contains little timber of value, but is inclined to be very wet at high water on the river. The soil is a light clay inclined to be sandy. The land in

the south half of sec. 17 adjoining is similar to the north half of sec. 8. Portions of this land show no indication of flooding, so that intending settlers would do well to carefully observe indications of flooding before choosing parts of these lands. When cleared, sec. 8 will make ideal farming lands. No better are to be found in the valley. The eastern half of sec. 18 and the north half of sec. 17, though somewhat heavily wooded with cedar and hemlock, offer a considerable area of first-class farming land when cleared. Here again clearing will be an expensive operation. The soil remains a clay loam, sandy in some places. Here the extensive bottom lands shift to the eastern side of the river, and from this point north to Revelstoke very little good land is to be found in the bottom on the west side of the Columbia.

P. B. Street, D.L.S., 1910.—This township can be most easily reached by the Arrowhead branch of the Canadian Pacific railway which runs, wherever possible, along the Columbia river, and traverses all the agricultural land in this township on the eastern side of the river. The stern-wheel steamer *Revelstoke* makes frequent trips up and down the river and lands freight at any desired point. A wagon road from Revelstoke to Arrowhead was completed last year as far as the northern boundary of the township. The soil is mostly sandy loam and is especially adapted to the growing of small fruits. Irrigation is necessary for late crops. There is very little land in this district suitable for farming as, in any places, the mountains slope right to the river bank. The best land is still held under timber berth rights, and settlers are excluded. Some small patches of good bench land occur here and there on the hills, but could be utilized only to grow small fruits. There is plenty of water for irrigation purposes in the numerous springs and small creeks which give a permanent supply. Very little timber of value is found outside the timber berths, the most valuable being the cedar in sec. 8, which is from 18 to 36 inches in diameter. Large fir trees are found on the uplands in the north-eastern quarter of the township, but they could not be logged profitably. The bottom or bench lands near the river have nearly all been logged off, and only light, second-growth scrub remains. Except the Columbia river there are no large streams. Considerable water-power could be developed from a small creek, in sec. 9, which falls about 540 feet in less than 20 chains. The climate is much more subject to extremes than that of the Shuswap district, and there is much less rainfall during July and August. No summer frosts were reported. Fir, birch and hemlock, for fuel, can be obtained in abundance everywhere, and it is more than probable that fuel will be taken from here for sale in Revelstoke when the wagon road to that place is completed. No stone-quarries nor minerals were observed. Grouse and black bears were seen on the bench lands, and mountain goats, deer, caribou and grizzly bears are numerous on the uplands. Good salmon trout are caught in the Columbia river at certain seasons. Some hay lands occur on the flats in secs. 4, 8, 17 and 19, but the hay is generally spoiled by the mud deposited on it by the river at times of overflow. One of the settlers refused to let his horse eat the hay.

H. G. Wheeler, D.L.S., 1908.—SEC. 3, SOUTH OF RIVER; SEC. 4, SOUTH OF RIVER.—Bottom land rising to 50 feet above the river, very wet, broken by sloughs and subject to flooding, might be used for hay or grazing purposes; soil, wet sandy clay loam; timber, cottonwood, and alder, with some cedar and hemlock, the best timber has been logged, within timber berth 316.

SEC. 4, ISLANDS.—Easterly island covered with willow brush, unsuited for agricultural purposes, westerly island timbered with good hemlock and cedar.

SEC. 8, SW. $\frac{1}{4}$, WEST OF RIVER; SEC. 5, NE. $\frac{1}{4}$, WEST OF RIVER.—A narrow strip of bottom land extends back a short distance to steep mountain side, land swampy and of very doubtful agricultural value, within timber berth 316.

SEC. 5, NE. $\frac{1}{4}$, PART OF ISLAND; SEC. 4, NW. $\frac{1}{4}$, PART OF ISLAND.—Island timbered with good hemlock and cedar.

SEC. 7, FRAC. N. $\frac{1}{2}$.—Bench land rough and broken, rising up mountain side, of no agricultural value excepting a small flat in NE. corner, narrowing down to river;

this flat would make good farming and fruit land; soil, sandy loam; timber, hemlock and cedar to 2 feet diameter, within timber berth 392, a small stream flows through the flat.

SEC. 8, FRAC. N. $\frac{1}{2}$.—Bottom land 20 to 30 feet above river, northern part swampy and cut up by sloughs, is flooded at high water, remainder good agricultural land, suitable for farming and fruit growing; soil, clayey loam; timber, small and large poplar, birch and small willow with a few big hemlock and cedar.

S. $\frac{1}{2}$, EAST OF RIVER.—Bottom land 20 to 30 feet above river, good agricultural land, suitable for farming and fruit growing; soil, clayey loam; timber, large hemlock and cedar of lumber value, within timber berth 128.

SEC. 9, W. $\frac{1}{2}$ OF SW. $\frac{1}{4}$.—Bottom land south of railway; north of railway bench land rising to 100 feet above river, fair agricultural land, suitable for fruit growing; soil, sandy and clayey loam, on bench land stony in parts; timber, large cedar and hemlock south of railway, on bench land jack pine and some birch.

SEC. 17, FRAC. SE. $\frac{1}{4}$, SW. $\frac{1}{4}$ EAST OF RIVER.—Bottom land generally a swampy flat inundated at high water, poor agricultural land; soil, wet loam; timber, covered by tall poplar to 12 inches diameter, small cottonwood and willow brush around sloughs.

SEC. 17, ISLANDS AND PART WEST OF MAIN CHANNEL OF RIVER.—Bottom land low and swampy, subject to flooding at high water, of no agricultural value; soil, wet loam; timber, cottonwood, birch and willow, part on mainland within timber berth 392.

SEC. 18, FRAC. E. $\frac{1}{2}$.—Chiefly bottom land, subject to flooding at high water and too wet to be of much value; soil, clay loam; timber, cottonwood, birch and willow, within timber berth 392. On the west side of NE. $\frac{1}{4}$ is some bench land 30 to 50 feet above the river; it contains a meadow and would make good hay land; along the west side of SE $\frac{1}{4}$ are some steep hills.

SW. $\frac{1}{4}$.—Bench land 700 feet above the river, good agricultural land, suitable for farming and fruit growing; soil, sandy loam, timber, hemlock and cedar 2 feet diameter within timber berth 392; $\frac{1}{4}$ section broken by hills along the east boundary, a small stream flows through SW. corner.

NW. $\frac{1}{4}$.—Bench land 30 feet and upwards above the river; a low bench on the east side near the river contains a meadow and would make good hay land; soil, sandy loam; a bench 700 feet above river in SW. corner is suitable for farming and fruit growing; soil, clay loam; timber, hemlock and cedar to 2 feet diameter, within timber berth 392, with exception of parts mentioned above the $\frac{1}{4}$ is too rough to be of much agricultural value.

SEC. 19, EAST OF RIVER.—Bottom land 20 to 30 feet above river, good agricultural land, suitable for fruit growing; soil, sand and clay loam; timber, thickly grown hemlock and cedar to 4 feet, diameter, of lumber value, cottonwood and willow brush very thick near river, within timber berth 127.

SEC. 20, NW. $\frac{1}{4}$ S.W. $\frac{1}{4}$ NORTH OF RIVER AND WEST OF RAILWAY.—Bottom land 20 to 30 feet above river, very good agricultural land, well suited for fruit growing; soil, sandy and clayey loam; timber, thickly grown with hemlock and cedar to 4 feet diameter of lumber value, within timber berth 127, slough traverses these $\frac{1}{4}$ sections.

SEC. 20, EAST OF RAILWAY.—Bench land 100 to 580 feet above river, good agricultural land, well suited for fruit growing; soil, rich clay loam, rocky in places, well watered by numerous small streams; timber, thick growth of birch, small poplar and some small maple, within timber berth 127, NE. $\frac{1}{4}$ traversed by strong-flowing creek, part known as "The Green Slide," too steep for agricultural purposes.

SEC. 30, NW. $\frac{1}{4}$; S.W. CORNER OF NE. $\frac{1}{4}$.—Low swampy land flooded at high water not suited for agricultural land, good hay land, goes back to mountain slopes within timber berth 127.

FRAC. SW. $\frac{1}{4}$.—Bottom land 20 feet above river, agricultural land, suited for fruit growing; soil, sandy loam with gravel subsoil; timber, hemlock and cedar to 4 feet diameter, of lumber value, within timber berth 127.

SE. $\frac{1}{4}$, SEC. 29, SW. CORNER OF SW. $\frac{1}{4}$.—Bottom land, north of railway low and swampy, not well suited for agriculture, south of railway, 20 feet above river, agricultural land suited for fruit growing; soil, sand and clay loam; timber, thickly grown with hemlock and cedar to 4 feet diameter of lumber value, cottonwood and willow, within timber berth 127.

SEC. 30, PART OF ISLAND; SEC. 19, PART OF ISLAND.—Bottom land, low and wet, subject to flooding at high water, not suited for agricultural purposes other than hay and grazing; soil, sandy loam, timber, cottonwood and willow.

SEC. 31, SW. $\frac{1}{4}$ OF NW. $\frac{1}{4}$.—Low swampy land but slightly above river, subject to flooding at high water, not suited for agricultural purposes other than hay and grazing, partly in timber berth 127.

SW. $\frac{1}{4}$.—Low swampy land thickly timbered with cedar to 4 feet diameter of lumber value, not suited for agricultural purposes, subject to flooding at high water partly in timber berth 127.

Tp. 22, R. 2, W. 6th Mer. *H. G. Wheeler, 1908.*

SEC. 13, EAST $\frac{1}{2}$.—Rough broken bench land rising 700 feet above the river to steep slopes of mountain; the only land of value is a bench on the east side which runs out in the NE. $\frac{1}{4}$. This bench would make good agricultural land suitable for farming or fruit growing; soil, rich sandy loam with gravel subsoil; timber, hemlock and cedar to 2 feet diameter, within timber berth 392.

SEC. 25, PART OF ISLAND; SEC. 24, PART OF ISLAND.—Bottom land, low and wet, subject to flooding at high water, not suited for agricultural purposes other than hay and grazing; soil, sandy loam; timber, cottonwood and willow.

SEC. 36, FRACTIONAL SEC. 25, EAST OF RIVER.—Bottom land subject to flooding at high water, not good agricultural land, chiefly suited for hay and grazing purposes; soil, wet loam; timber, cottonwood, birch and willow; on SE. $\frac{1}{4}$ thickly timbered with cedar to 4 feet diameter of lumber value, within timber berth 127.

T. H. Plunkett, D.L.S., 1909.—Sec. 20 lies on a western slope, which, at the eastern boundary of the sec., reaches an elevation of about 2,000 feet above Columbia river. The western half of this sec., though expensive to clear, offers some excellent farming and fruit lands, while the eastern half, until reaching too high an elevation for agriculture, can be farmed to advantage. Generally speaking the islands in Columbia river are of doubtful utility for fruit raising or agricultural purposes of any kind. The soil consists almost entirely of sand, and the indications point to their being at times, badly flooded.

P. B. Street, D.L.S., 1910.—This township is most easily reached by boat from Revelstoke or by railroad and rowboat across the Columbia river. Most of the township is comprised in a timber limit and is unsurveyed. The portion of the island lying in secs. 24 and 25 is mostly flat and wooded with cottonwood, spruce and willow. The portion in sec. 24 is flooded land, while most of that in sec. 25 is bench land. As this land is very easily cleared the bench would no doubt be good farming land, either for fruit or root crops and garden products.

C. H. Taggart, D.L.S., 1911 (Partial).—The district was reached by train from Revelstoke, our first camp being situated at the "seven and one-half" mile board in the northeastern quarter of sec. 25. The land along the northern boundary of sec. 36 is good level land on which the timber has recently been logged off. The soil is a light sandy loam and is suitable for the growth of hardy vegetables and possibly fruit to the smaller varieties. Along the northern boundary of sec. 35 and west of the Columbia river the country is steep and rocky, covered with cedar, hemlock and scrub and underbrush. The land is of no value.

Tp. 23, R. 2, W. 6th Mer. H. G. Wheeler, 1908.

SEC. 1, S. $\frac{1}{2}$ and NE. $\frac{1}{4}$, WEST OF SLOPES OF MOUNT MACKENZIE.—Bottom land largely subject to flooding at high water, not good agricultural land, suited for hay and grazing purposes, soil, wet loam; timber, cedar 2 to 4 feet diameter, of lumber value, cottonwood, birch and willow brush, within timber berth 88.

SEC. 2, FRAC. E. $\frac{1}{2}$.—Bottom land subject to flooding at high water, unsuited for agricultural purposes other than hay and grazing; soil, wet loam; timber, cottonwood, a few cedar and birch, undergrowth very thick, within timber berth 88.

NW. $\frac{1}{4}$ EAST OF RIVER.—Bottom land rising to 30 feet above river, agricultural land, suitable for fruit growing; soil, sandy loam; timber, cottonwood, cedar and birch, large cedar logged, within timber berth 88.

SEC. 2, NW. $\frac{1}{4}$ WEST OF RIVER; SEC. 3, NE. $\frac{1}{4}$.—Bench land rising to 400 feet above the river, extending back to steep mountain side, agricultural land, a good flat in NE. $\frac{1}{4}$ suitable for fruit and vegetables; soil, sandy loam with gravel subsoil, stony and gravelly towards the west; timber, good cedar and hemlock to 2 feet diameter, of lumber value, within timber berth 528.

SEC. 10, WEST OF RIVER.—Bench land rising to 500 feet above the river, broken by mountain slopes in SW. corner, land suitable for farming and fruit growing; soil, rich sandy loam; timber, hemlock to 2 feet diameter, with small balsam and pine, for the most part within timber berth 528.

SEC. 10, NE. $\frac{1}{4}$ EAST OF RIVER; SEC. 11, FRAC. W. $\frac{1}{2}$.—Bottom land subject to flooding at high water, unsuited for agricultural purposes other than hay and grazing; soil, wet clay loam; timber, heavy growth of cottonwood and willow brush with some large cottonwood and cedar of lumber value, within timber berth 88.

SEC. 11, E. $\frac{1}{2}$.—Bottom land rising to 20 feet above river, good agricultural land, suited for fruit growing; soil, rich clay loam; timber, large hemlock and cedar of lumber value, partly logged, within timber berth 88.

SEC. 12, NW. $\frac{1}{4}$.—Bottom land and bench land rising from 20 to 100 feet above river, some good agricultural land suitable for fruit growing; soil, light clay loam; timber, large hemlock and cedar to 3 feet diameter, with thick underbrush, of lumber value, within timber berth 88, stream flows through centre of $\frac{1}{4}$ section.

SW. $\frac{1}{4}$.—Chiefly bottom land rising to 20 feet above river; NE. corner bench land 100 feet above river, good agricultural land, S. $\frac{1}{2}$ probably too low for fruit trees, bench land good for fruit growing; soil, light clayey loam; timber, hemlock and cedar to 2½ feet diameter, of lumber value, within timber berth 88, a lake 20 to 25 chains long by about 5 chains wide is located in SE. corner of the $\frac{1}{4}$ section; beyond rise the steep slopes of mount Mackenzie.

SEC. 13, E. $\frac{1}{2}$ OF NW. $\frac{1}{4}$, E. $\frac{1}{2}$ OF SW. $\frac{1}{4}$.—Some small benches, 300 feet and upwards above river, rising to steep slopes of mount Mackenzie, possibly agricultural land, might grow fruit trees; soil, clay loam, rocky in places; timber, hemlock to 18 inches diameter, and a few cedar, E. $\frac{1}{2}$ of SW. $\frac{1}{4}$ within timber berth 88, bench land, difficult of access.

W. $\frac{1}{2}$ OF SW. $\frac{1}{4}$.—Bench land rising 100 feet and upwards above river to steep slopes of mount Mackenzie, good agricultural land, well suited for fruit growing; soil, light clay loam; timber, hemlock to 18 inches diameter, and a few cedar, within timber berth 88.

SEC. 14, PART NE. $\frac{1}{4}$.—Rolling bench land rising from 100 to 300 feet above river, good agricultural land, well adapted for fruit growing; soil, light clayey loam; timber, chiefly brulé; a nice little lake used by the people of Revelstoke for bathing purposes is located in the NE. $\frac{1}{4}$ of the $\frac{1}{4}$ section.

PART S. $\frac{1}{2}$ NORTH AND EAST OF MONTANA SLOUGH.—Chiefly bottom land rising 25 to 30 feet above river; eastern portion is bench land, 100 feet above river and up, first-class agricultural land, suited for fruit growing; soil, rich clay loam; timber on bottom land some large cedar and hemlock of lumber value, on bench land brulé, partly

cleared, within timber berth 88, on NW. corner of SE. $\frac{1}{4}$ section is a valuable meadow owned or leased by S. D. Crowle.

SEC. 14, SW. $\frac{1}{4}$ SOUTH OF MONTANA SLOUGH; SEC. 15, SE. $\frac{1}{4}$ SOUTH OF MONTANA SLOUGH; ISLAND BETWEEN TWO ARMS OF MONTANA SLOUGH, SW. $\frac{1}{4}$ SOUTH OF MONTANA SLOUGH.—Bottom land, low, subject to flowing at high water, may not be suitable for agricultural purposes other than growth of hay; soil, rich sandy clay loam with topping of vegetable mould; timber, cedar, cottonwood and willows, within timber berth 88.

SEC. 15, NW. $\frac{1}{4}$, EAST OF RIVER.—Bottom land 25 to 30 feet above river, first-class agricultural land well suited for fruit growing, soil, light clayey loam; timber brûlé.

WEST OF RIVER.—Uneven bench land rising to 300 feet above river, of very little agricultural value, steep rocky slopes; soil, sandy loam with gravel sub-soil; timber small birch, pine, balsam and hemlock, not within a timber berth.

SEC. 16.—Rolling bench land 100 to 700 feet above river, with exception of NW. $\frac{1}{4}$ which contains a large hay meadow and is for the most part level, the section is rather rough but would be suitable for fruit growing in parts; soil, black loam in the lower parts, and gravelly and stony on higher; timber, small pine, spruce, birch, poplar and alder with some cedar and hemlock 3 to 4 feet diameter, not within a timber berth.

SEC. 21, SW. $\frac{1}{4}$.—Bench land 400 to 700 feet above the river, some agricultural land suitable for fruit growing; soil, black loam with sandy sub-soil, stony in places; timber, small cedar, spruce, birch and poplar, not within timber berth.

FRAC. NE $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land rising 150 to 400 feet above river, broken on the east by steep slopes to water's edge, agricultural land suitable for farming or fruit growing; soil, sandy loam with gravel sub-soil, stony in places; timber, small cedar and hemlock with some cottonwood and birch, not within timber berth.

SEC. 22, WEST OF RIVER.—Bench land rising to 150 feet above the river, steep slopes of very little agricultural value; soil, clay loam and stony; timber, small cedar and hemlock, not in timber berth.

SEC. 24, E. $\frac{1}{2}$ OF SW. $\frac{1}{4}$.—Some small benches 300 feet and upwards above Columbia river rising to steep slopes of mount Mackenzie, possible agricultural land, might grow fruit trees; soil, clay loam, very rocky in most places; timber, hemlock to 18 inches diameter, with some cedar, bench land, difficult of access.

SEC. 25, PART SW. $\frac{1}{4}$.—Bench land rising to 150 feet above Columbia river, SW. corner of $\frac{1}{4}$ section agricultural land, suitable for fruit growing; soil, light clay loam; timber, small poplar, spruce and pine, partly cleared.

SEC. 28, S. $\frac{1}{2}$ OF SW. $\frac{1}{4}$; SEC. 21, NW. $\frac{1}{4}$.—Rolling bench land 400 to 500 feet above river, some parts would make good agricultural land, might be suitable for fruit growing; soil, sandy loam with gravel subsoil, very rough in places; timber, cedar, hemlock, birch and poplar, a few scattered large trees, not within timber berth.

SEC. 30, NW. $\frac{1}{4}$ (S. $\frac{1}{2}$), *A. J. Campbell, D.L.S., 1909.*—South part rolling bench land, altitude from 50 to 75 feet above the Tonka Watla river; soil, brownish loam, rocky in places; covered with small poplar, birch, fir, cedar and spruce, value as fruit land 50 per cent irrigation not necessary; balance of land is on steep rocky slopes, worthless.

T. H. Plunkett, D.L.S., 1909.—In sec. 9 a limited amount of excellent bench land was found, and in sec. 16 there is some good land, slightly elevated and in places heavily wooded. Turning new to lands east of the Columbia, secs. 1, 2, 11 and 12 of this township, and secs. 19, 36, 30 and the west half of sec. 31, township 22, are almost entirely bottomlands, well suited for farming and fruit raising. The soil is a clay loam, sandy in some places, but, generally speaking, much the same as has been described for lands farther south. The bush on these lands is heavy, and clearing here also will be an expensive item. Some farming is already going on in secs. 1 and 12. Garden produce on these farms this season was of excellent quality. Fruit raising here has, as yet, not reached a sufficiently advanced stage to afford comparison. The northwest quarter of sec. 12

is elevated land lying on a gradual western slope, not steep enough, however, nor reaching a sufficiently high elevation to interfere with farming.

P. B. Street, D.L.S., 1910.—A wagon road from Revelstoke runs through this township, and affords easy access to that town. There is considerable bench land, most of which is held under timber limit rights. Quite a large area of land has been taken up by Italian settlers, who raise fruit, vegetables and poultry for the local market. The timber is being rapidly logged off, and before long a great deal of good land will be available for settlement. Legal subdivisions 4 and 5, which I surveyed in sec. 6, are bench land rather densely wooded with small timber and are good for fruit lands. Like all land in this district, irrigation is necessary for late crops.

G. H. Blanchet, D.L.S., 1910.—The Columbia river crosses this township in a southerly direction, where it is navigable for boats of shallow draught. The town of Revelstoke occupies part of sec. 27. The main line of the Canadian Pacific railway crosses this township in an easterly and westerly direction and passes through Revelstoke, from which point the Arrow Lakes line branches off, following the easterly bank of the river. On the same side of the river a good provincial road has been constructed for about 6 miles, and another is being projected southward on the west side of the river. The east side of the township is occupied by mount McKenzie, and the west side includes the easterly slope of mount McArthur. The land of agricultural value in this township includes the lower slopes and foot-hills of these mountains, and is probably best adapted to fruit growing. The river benches are suitable for growing hay, grain and vegetables and in some places for fruit. The soil varies from sand on the lower benches to a hard clay on the higher ground, while on the mountain side, as a rule it is a sandy loam containing much rock. Most of the large timber has been either felled or destroyed by fire, except in secs. 13, 14, 11 and in the southwest quarter of the township, where some still remains. There is some good hay-land in the southeast quarter of the township and several old beaver meadows were found on the west side of the river. Good water is abundant. The Illecillewaet river, which crosses the northeast quarter of the township and empties into the Columbia river below Revelstoke, supplies power to the town. The summer is very warm and the fall and winter rather mild with excessive precipitation. Frost sometimes occurs in September. No coal, lignite nor minerals of economic value were observed. Wood for fuel is abundant. There are a few mountain sheep, caribou, and deer ranging on the mountains. The lower river bench, occupying portions of secs. 1, 2 and 11 and extending southwards into the next township, is much broken by sloughs, but, as it has sufficient elevation above the river for drainage, it could probably be reclaimed.

There is a good wagon road from Revelstoke running south through the eastern half of section 14 and branching into the northwestern quarter of section 13. The soil in this township varies from a sandy loam with scattered rocks to practically all rocks as the elevation increases. Fruit could probably be grown where conditions as to water and elevation make cultivation practicable. Most of the mountain side has been burned over, but several areas of large cedar, fir, tamarack and pine escaped. These areas occur in the northwestern quarter of sec. 18. The remainder is covered with scrub and second growth timber. There is no hay. There is no permanent surface water supply, but the underground seepage from the snow above should make water readily accessible by wells. There are no water-powers. The climate appears to be suitable for any form of agriculture, although the rainfall is very irregular in summer. Frost was experienced on the 25th of August. There are no stone-quarries nor minerals. Game is scarce, only bears, deer, mountain goats and grouse being seen.

C. H. Taggart, D.L.S., 1911.—The eastern boundary of secs. 24 and 25 was reached from Revelstoke over a roughly-graded wagon road following closely the main line of

the Canadian Pacific railway. This road leads for only a short distance to Greely, about 7 miles from Revelstoke, and is good and hard, but rough. The country north of the Illecillewaet river is hilly, rough and rocky and covered with a second-growth scrub. This country was at one time thickly timbered with large cedar, but forest fires have left only burned stumps. South of the Illecillewaet river the line followed up the steep slope of mount MacKenzie, which is very rough and rocky. The lower portion is densely covered with scrub above which the timber is thick, consisting chiefly of hemlock, cedar and some spruce up to 30 inches in diameter. It is not of much value for timber, most of it being rotten or hollow at the heart. The soil is a shallow, light, sandy loam with rock outcrops everywhere, and is of no value for agriculture. The Illecillewaet river furnishes good water-power for generating electric energy for the city of Revelstoke, which it also furnishes with water. The dam for this power and water supply is located but a short distance below the point where the line crosses the river. The sections west of the Columbia river, which I retraced, are easily reached from Revelstoke by crossing the river over the new traffic bridge which connects with a new wagon road, graded during the past season and completed as far as the southwestern quarter of sec. 28. The clearing for its extension is done as far as the southern boundary of sec. 21. Work was commenced on the northern boundary of the southwestern quarter of sec. 29. This portion of country is very rough and rocky. The side hill is very steep and, in many places, precipitous rocky bluffs made accurate work difficult. In the western portion of secs. 20, 17 and 7 and extending up the northern slope of mount MacPherson, is found an excellent belt of timber consisting of hemlock up to 36 inches, cedar up to 8 feet in diameter and scattered spruce and white pine. Most of the timber is in timber berth 528. The balance of the sections mentioned is covered with a thick growth of small timber. The soil is a light sandy loam with rocks and rock outcrops at intervals and, with the exception of a few very small patches, is of little value for agriculture. The work in secs. 4, 5, 7, 8 and 9 was reached by cutting a pack-trail from the end of the road clearing to the northeastern quarter of sec. 8. An excellent water supply can be obtained from the various small streams flowing down the slope to the Columbia river. No hay was seen. There are no water-powers. Wood of all kinds is available for fuel. No summer frosts are experienced in this district. There are no minerals nor stone-quarries. No game of any kind was seen.

Tp. 24, R. 2, W. 6th Mer. *H. G. Wheeler, 1908.*

SEC. 4, WEST OF RIVER.—Bench land rising back from the river in steps to 200 feet above good agricultural land, suitable for fruit growing; soil, rich loam with sand subsoil; timber, cedar and hemlock to 2½ feet diameter, of lumber value; south portion has been burned over, within timber berth 221.

SEC. 5, EAST OF THE JORDAN RIVER.—Uneven bench land to 300 feet above Columbia river, may be suitable for agricultural purposes in parts; soil, dark loam with sand subsoil, very stony in places; timber, cedar to 4 feet diameter, and hemlock, of good lumber value, within timber berth 220.

SEC. 8, PART SE. ¼.—Slightly rolling land, 300 feet above Columbia river, good agricultural land, suited for fruit growing if not too dry; soil, rich loam with sand subsoil; timber, hemlock to 3 feet and cedar 6 feet diameter, of good value, very little underbrush, lumber within timber berth 74.

SEC. 9, WEST OF RIVER.—Rolling bench land, rising back from river to 250 feet above, good agricultural land, suited for fruit growing; soil, rich black loam with sand subsoil; timber, hemlock to 3 feet and cedar to 6 feet diameter, of good lumber value, within timber berth 74; two small streams traverse the section, the centre one with flow sufficient for irrigation purposes.

SEC. 9, SE. ¼, EAST OF RIVER; SEC. 10, PART SW. ¼.—Bench land rising back from river to 500 feet above, to steep mountain side; some agricultural benches and slopes where fruit trees may be grown, N. ½ of agricultural land in SW. ¼ section 10, is a

level flat; soil, rich clay loam with sand and gravel subsoil, very stony in parts; timber, old brulé grown with small hemlock, cottonwood and cedar, thick pine, balsam and hemlock brush, has been logged, within timber berth 207.

SEC. 9, NE. $\frac{1}{4}$ EAST OF RIVER; SEC. 10, PART NW. $\frac{1}{4}$.—Bench land rising 60 to 100 feet above river, to steep mountain side, generally level land, suitable for agricultural purposes including fruit growing; soil, sand and sandy loam, stony in parts with gravel subsoil, of better quality nearer mountain; timber, scattered small hemlock and underbrush, has been logged, all good timber taken off, within timber berth 207.

SEC. 15, SW. $\frac{1}{4}$ SOUTH OF RIVER.—Bench land rising from 60 to 100 feet above river, to steep slopes of mountain, land generally level, may be fit for agricultural purposes, and may be suitable for fruit growing; soil, sand and sandy loam with gravel subsoil, stony in parts and gravelly near mountain; timber, scattered small hemlock and underbrush, all good timber has been logged, within timber berth 207.

SEC. 23, PART NW. $\frac{1}{4}$ EAST OF RIVER; SEC. 26, PART SW. $\frac{1}{4}$ EAST OF RIVER.—Uneven and fairly level bench land rising from 50 to 130 feet above the river, some good agricultural land suitable for fruit growing, soil rich sandy loam with gravel subsoil, stony in parts; timber, small cedar, and hemlock, best timber has been logged, within timber berth 73.

SEC. 26, PART NW. $\frac{1}{4}$ EAST OF RIVER; SEC. 35, PART SW. $\frac{1}{4}$ EAST OF RIVER.—Bench land rising 50 feet above river, good agricultural land suitable for fruit growing; soil, rich sandy loam; timber, hemlock and cedar to 4 feet diameter, of lumber value, within timber berth 73.

E. W. Robinson, D.L.S., 1909.—This township lies in the valley of Columbia and Jordan rivers immediately north of Revelstoke. A wagon road, kept in excellent condition, follows the east bank of the Columbia, which gives direct access to Revelstoke. There is also an old trail along the west side of Jordan river starting from the "Big Eddy" mill on the west side of the Columbia opposite Revelstoke. The township is mostly well timbered with large hemlock, cedar, Douglas fir, white pine and spruce. Fires have destroyed the timber in the west half of sec. 10. The only land suitable for agricultural purposes in the northern part of the township consists of two patches of from 50 to 60 acres in extent on the east side of the Columbia lying along the north boundaries of secs. 23 and 26. The soil here is 6 inches of humus overlying a sandy loam subsoil, usually rocky. They are well timbered with hemlock, cedar and fir up to 30 inches in diameter. The land along the north boundary of sec. 23, known as Steamboat landing, has been partly logged. The only other land of agricultural value lies in secs. 4, 5, 6, 7, 8, 9 and 10, and is known as the "Jordan flats." It is all timbered, the principal varieties being hemlock and cedar up to 24 inches, with a few cedar up to 42 inches, and some fir, white pine and spruce. The best timber has been logged from the west side of Jordan river, and a considerable portion taken from the land between Jordan and Columbia rivers. Creeks are scarce, and when the timber is removed the few existing one will probably only run in the spring. Wells would be necessary for the settlers' water supply, and owing to the sandy nature of the subsoil one would be compelled to go to the level of Jordan or Columbia river to secure water. The soil consists of from 2 to 6 inches of humus overlying a sandy subsoil. In low-lying spots there is rich black muck with a clay subsoil. Jordan river has a rapid fall and it would be possible to obtain water by pipe line from some distance up the river, but the expense would be greater than the average settler could afford. Fruit could be raised successfully, for this has been demonstrated on similar lands close to Revelstoke, but the soil is rather light for mixed farming. There are falls on Jordan river in the southwest quarter of sec. 8 which could be developed to produce enough power to provide light for settlers. There are no hay meadows, no minerals of economic value were found and no stone-quarries exist. Wood for fuel can be obtained anywhere. Black bears are numerous, especially in the fall; caribou can be obtained on the adjoining hills, and the head-waters of Jordan river are noted for the large grizzly bears to be found there. Willow, blue grouse and partridges abound, and Jordan river is a well-known trout stream.

P. B. Street, D.L.S., 1910.—Part of the town of Revelstoke lies in secs. 3 and 4 of this township. A good wagon road runs northerly for 8 miles and connects with the Big Bend pack-trail. Very little land in this district is suitable for agriculture, as the mountains in most places rise directly from the river, leaving little or no bench or bottom lands. In secs. 9, 10 and 15, on the east side of the Columbia river, is found some excellent land, which is flat and all logged off. The soil is mostly rich sandy loam with a clay subsoil and is especially adapted to the growth of small fruits. Some very fine apples are grown in sec. 3. Water is plentiful in creeks and springs as well as in the Columbia river, from which water can be easily obtained. There is no hay land. Nearly all the timber of value has been taken from the eastern side of the river, but in sec. 5, on the western side, cedar and hemlock from 18 to 48 inches in diameter are found. This land, from an agricultural point of view, is similar to that east of the river.

Tp. 26, R. 2, W. 6th Mer. *H. G. Wheeler, 1908.*

SEC. 3, NW. $\frac{1}{4}$ WEST OF RIVER; SEC. 9, PART SE. $\frac{1}{4}$; SEC. 10, SW. $\frac{1}{4}$ WEST OF RIVER.—Narrow strip of bench land along river's edge that might be utilized as agricultural land, suitable for fruit and farm products; soil, clay loam; timber, small cedar and hemlock, within timber berth 360.

SEC. 9, NE. $\frac{1}{4}$ EAST OF RIVER; SEC. 10, NW. $\frac{1}{4}$ AND SW. $\frac{1}{4}$ EAST OF RIVER.—Level bench land 45 to 100 feet above river, good agricultural land, suitable for fruit growing and general farming; soil, dark clay loam with sandy subsoil; timber, small cedar hemlock, partly burned over and covered by second growth, some large cedar to 4 feet diameter near river, within timber berth 360. A squatter, James Hathaway, on NW. $\frac{1}{4}$.

SEC. 15, SW. $\frac{1}{4}$; SEC. 16, SE. $\frac{1}{4}$ EAST OF RIVER.—Rising back in a series of benches some 40 to 260 feet above the river, some good agricultural land, suitable for fruit growing. Twenty-mile creek with a good strong flow traverses both quarter-sections, land along creek low and wet, soil black loam with sand subsoil, cottonwood and a few small cedar and hemlock along creek, land on benches stony; soil, dark clay loam with sand subsoil; old brulé, benches may be found too dry and stony for good cultivation, within timber berth 360.

SEC. 16, NE. $\frac{1}{4}$ EAST OF RIVER; SEC. 15, PART NW. $\frac{1}{4}$.—Level bench land 200 feet above river and up, may be useful as agricultural land and might possibly grow fruit; soil, sand and gravel, very stony throughout; timber, some good cedar, within timber berth 360.

SEC. 21, S. $\frac{1}{2}$ EAST OF RIVER.—Rolling bench land 200 to 450 feet above river, some level and gently sloping agricultural land, suitable for fruit growing; soil, rich red loam with gravel subsoil; timber, some good cedar 2 to 3 feet diameter, within timber berth 360.

N. $\frac{1}{2}$ EAST OF RIVER.—Hilly and rolling bench land, rising to 400 feet above the river, some good agricultural benches suitable for fruit growing; soil, dark loam with sand subsoil; timber, small cedar and hemlock, within timber berth 360, a large creek flows through NE. $\frac{1}{4}$.

SEC. 28, FRAC. SW. $\frac{1}{4}$, PART SE. $\frac{1}{4}$.—Rough hilly bench land rising to 400 feet above river, some agricultural flats and slopes here and there, suitable for fruit growing; soil, rich black loam with sand and gravel subsoil; timber, small hemlock and cedar, within timber berth 105; a large creek flows from mountains through SE. $\frac{1}{4}$.

PART NW. $\frac{1}{4}$; SEC. 29, NE. $\frac{1}{4}$ EAST OF RIVER.—Rolling and broken bench land rising to 200 feet above river and up, some good agricultural flats and slopes here and there suitable for fruit growing; soil, rich loam with sandy subsoil; timber, small hemlock and cedar to 2½ feet diameter, some scattered trees to 3 feet diameter, within timber berth 105; several small streams traverse these $\frac{1}{4}$ sections.

SEC. 32, FRAC. SE. $\frac{1}{4}$.—Bench land rising to 200 feet above river and up to steep mountain side, some patches of fairly level agricultural land here and there suitable for fruit growing; soil, rich black loam; timber, chiefly hemlock, scattered cedar to 3 feet diameter, within timber berth 105.

SEC. 32, N. $\frac{1}{2}$ EAST OF RIVER.—Bench land rising to 100 feet above river and up to steep mountain side, good agricultural land, well watered; soil, heavy dark loam with sandy sub-soil; timber, scattered fir and hemlock to 3 feet diameter, of lumber value, within timber berth 105.

Tps. 26 and 27, R. 2, W. 6th Mer. *E. W. Robinson, D.L.S., 1909.*

These townships lie in the valley of Columbia river from 16 to 24 miles north of Revelstoke. During the summer months a steamboat plies on Columbia river, starting in the earlier part of the season from Steamboat landing, distant about 6 miles from, and connected by stage with Revelstoke, and in the latter part of the season starting from the city wharf at Revelstoke. There is a Provincial Government pack trail commencing at the end of the wagon road at Steamboat landing and extending along the east side of Columbia river. This trail is in fair condition except in the early spring, when the water from the melting snow in the sidehills renders it almost impassable. These townships are well timbered with hemlock, cedar, Douglas fir, white pine and spruce. The only land available and suitable for agricultural purposes is a strip averaging about half a mile in width lying along the east bank of Columbia river; it averages from 20 to 300 feet above the river, and in places is cut up by creek valleys; approximately three-fourths of it is suitable for cultivation. It is generally covered with a heavy growth of large cedar, hemlock, Douglas fir, white pine and spruce, the cedar reaching a diameter of 9 feet and the other varieties 3 feet. The southwest quarter of sec. 15 and the west half of sec. 10 have been burnt. The soil consists of from 6 to 12 inches of humus overlying a sandy subsoil. In a few spots there is 6 to 12 inches of rich black muck, with a heavy clay subsoil; these spots are usually marshy and would have to be drained which in all cases could be readily done. Surface rock shows, being specially noticeable on the steeper slopes. There are no hay meadows. The land is well watered, numerous small creeks of excellent spring water being found throughout. The clearing of this land would be expensive owing to the heavy growth of timber and underbrush. Mixed farming would undoubtedly be successful, and the country has every indication of being suitable for the hardier varieties of fruit. The climate is an equable one, the precipitation of moisture in summer is ample and no summer frosts were experienced. Wood for fuel can be obtained anywhere in the township, but no coal or lignite veins were seen. No stone-quarries exist and no minerals of economic value were seen. There are numerous rapids on Columbia river, but they are not well suited for the production of power. Caribou, deer, black bears, lynx, marten and the smaller fur-bearing animals are to be found.

Tp. 27, R. 2, W. 6th Mer. *H. G. Wheeler, 1908.*

SEC. 5, PART W. $\frac{1}{2}$ EAST OF RIVER.—Bench land rising to 200 feet to steep mountain side, land swampy, good agricultural land if it can be drained; soil rich loam with sand sub-soil in lower parts, sandy loam with gravel sub-soil in higher parts; timber, good cedar 2 to 3 feet diameter, and some hemlock of lumber value within timber berth 105.

SEC. 6, N. $\frac{1}{2}$, EAST OF RIVER.—Bench land 100 to 250 feet above river, part lying nearest mountain low and swampy, good agricultural land suitable for fruit growing on high portion and on low portion if it can be drained; soil, on high part, light sandy loam with clay sub-soil, on low part rich black loam with sand sub-soil; timber, large and small hemlock and scattered cedar, some large cedar to 4 feet diameter in low parts, of lumber value, within timber berth 105.

Tp. 23, R. 3, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 7, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Between C.P.R. and Eagle river, a narrow strip of bottom land, sandy clay, should make good hay land, thick scrub; north of C.P.R. steep rock slopes rise, covered with small scrub, worthless; south of Eagle river slopes rise, timbered with hemlock and cedar up to 3 feet in diameter, good timber value.

SEC. 16, NE. $\frac{1}{4}$ (N $\frac{1}{2}$).—Bench land in north part from 10 to 150 feet above the valley, soil sandy loam with stone and rock in places, scrub and dead timber with cedar up to 3 feet in east end, of good value, 50 per cent fruit land, south part steep rocky slope.

SEC. 21, SE $\frac{1}{4}$ (S $\frac{1}{2}$).—South of C.P.R. bench land with marsh in east, altitude runs to about 75 feet above the valley, soil sandy loam, stone and broken rock, scrub and dead timber with some cedar to 3 feet diameter in east, 50 per cent fruit land, north of railway, steep rocky slopes rise.

SEC. 23, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Sloping land, rolling in parts, rising to 250 feet above the valley at the north, and then steep rocky slopes; soil light sandy clay with stone and rock in places, subsoil sandy and gravel in places, growth consists of young birch, poplar fir, cedar, pine and hemlock; soil needs irrigation which may be supplied from small streams, value as fruit land about 50 per cent, south of railway there is some marsh land along the river.

SEC. 23, SW. $\frac{1}{4}$.—Gradual slopes from south of railway to steep rocky slopes of mountain, altitude to about 100 feet above valley, north of railway, steep mountain side; soil south of C.P.R., sandy clay; timber consists of hemlock up to 2 feet and cedar up to 6 feet in diameter, good lumber value, lower parts along Tonkawatla river, good hay land or garden land, higher slopes 75 per cent fruit land, part in timber berth 355.

SEC. 24, NW. $\frac{1}{4}$.—South of C.P.R. and north of Tonkawatla river, bottom land with some marsh, rich black soil with sandy subsoil, growth, thick willows with a few small cedar, parts are liable to flood, 50 per cent farm land, north of C.P.R. bench and sloping land rising to 270 feet above the valley, soil is light sandy clay, much sand in subsoil, stone and rock scattered throughout, growth of small poplar, birch, hemlock, cedar and pine, 25 to 75 per cent fruit land.

SEC. 25, SW. $\frac{1}{4}$ (S. $\frac{1}{2}$).—SE. part bench land and rough slopes rising to 270 feet above bottom of the valley, with steep rocky slopes rising to NW., soil is light sandy clay with much sand in subsoil, also some stone and rock, growth of small birch, poplar, cedar, spruce and hemlock, parts 25 to 50 per cent fruit land.

Tp. 22, R. 4, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 21, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Narrow strip of bottom land along creek in west side, about 100 feet above Three Valley lake, steep rock slopes rise to the east and west, bottom land liable to flood, sandy loam with black soil in places, doubtful utility, possible hay land, good timber cut off and small cedar and hemlock up to 12 inches remain, in timber berth 457, on slope to west no timber of value.

SEC. 22, NE. $\frac{1}{4}$.—Small area of bench land about 500 feet above Three Valley lake in NW. corner, balance steep slopes, soil sandy loam, stony, scrub and brulé, 50 per cent fruit land on bench, in timber berth 365.

SEC. 22, NW. $\frac{1}{4}$.—Rising from bottom land 100 feet above Three Valley lake, in NW. corner to slopes and benches having altitude of about 500 feet above the lake, south is steep slopes, rocky in places, sandy clay soil and some stone, scrub and dead timber, brulé benches 75 per cent fruit land, bottom land of doubtful utility, liable to flood, possible hay land, in timber berth 365.

SEC. 27, NE. $\frac{1}{4}$.—Much bench land and steep slopes with some low flats liable to flood, altitude from 100 to 300 feet above Three Valley lake, soil light clay or sandy loam, stony in places, most of timber has been cut, some hemlock, 18 inches diameter remains, windfall and brulé, 50 per cent fruit land.

SEC. 27, NW. $\frac{1}{4}$.—Steep rocky slopes rise to the west from bottom lands in east part, altitude of bottom land about 20 feet above Three Valley lake, soil sandy clay, much swamp land, parts of possible utility as farm land, in timber berth 353.

SEC. 27, SE. $\frac{1}{4}$.—Rather broken bench land, almost hilly, with some steep slopes, altitude from 150 to 600 feet above Three Valley lake, soil stony loam, sandy in parts

cedars have been logged, hemlock up to 2 feet diameter of doubtful value, parts from 25 to 75 per cent fruit land, in timber berth 285.

SEC. 27, SW. $\frac{1}{4}$.—Broken bench land in SE. part with bottom land through centre and steep rocky slopes in NW., altitude from 100 to 300 feet above Three Valley lake, soil generally stony clay or sandy loam, timber is principally hemlock to 18 inches diameter, much windfall and brulé, bottom land liable to flood, of doubtful utility, possible farm land, bench about 30 per cent fruit land, in timber berth 353.

SEC. 34, SE. $\frac{1}{4}$.—Rather broken bench land, altitude from 100 to 450 feet above Three Valley lake, soil light clay and sandy loam, stony in parts, much brulé with some cedar up to 2 feet diameter, and hemlock to 18 inches, best of timber cut, 50 per cent to 75 per cent value as fruit land, in timber berth 326.

SEC. 34, NE. $\frac{1}{4}$.—North $\frac{1}{2}$ is very rocky and useless for cultivation, south $\frac{1}{2}$ has some fairly even bench land about 200 feet above Three Valley lake, soil is sandy loam, much brulé, cedar has been logged throughout, hemlock to 18 inches in windfall, doubtful value, 50 per cent fruit land, in timber berth 326.

SEC. 34, SW. $\frac{1}{4}$.—East part uneven bottom land, swampy in places altitude about 60 feet above Three Valley lake, to west, steep rocky slopes rise, brulé, windfalls, some hemlock up to 18 inches, most of timber cut, parts of bottom land about 50 per cent farm value, in timber berth 353.

SEC. 34, NW. $\frac{1}{4}$.—Broken land, rough and rocky, much brulé, some patches of workable land in east part, but too small to be of value, steep rocky slope in the west, in timber berth 363.

SEC. 35, SW. $\frac{1}{4}$.—Bench land in west part from 150 to 300 feet above Three Valley lake, east part steep slopes, soil sandy clay with clay subsoil, standing dead and live hemlock up to 18 inches, brulé and windfall, 75 per cent fruit land, in timber berth 457.

Tp. 23, R. 4, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 2, SW. $\frac{1}{4}$, FRAC.; SEC. 3, SE. $\frac{1}{4}$ FRAC.—Stony, rocky bench land about 200 feet above Three Valley lake. scrub, windfall and brulé, worthless, in timber berths 457 and 363.

SEC. 3, SW. $\frac{1}{4}$.—NE. part rather rough bench land, rocky towards Three Valley lake, altitude from 100 to 200 feet above lake, soil sandy clay with patches of rich black loam, scrub and fallen timber, 50 per cent fruit land, SW. part steep rocky slope, in timber berth 363.

SEC. 3, NW. $\frac{1}{4}$.—North and east parts rough and rocky, south and west parts fairly even sloping bench land, broken in places, from 50 to 200 feet above Three Valley lake, soil sandy clay with black loam in places, small cedar and hemlock up to 12 inches in places with much windfall and scrub, also some brulé, 75 per cent fruit land, in timber berth 363, Jim Gin (Chinaman) squatted on this quarter.

SEC. 9, SE. $\frac{1}{4}$; SEC. 10, SW. $\frac{1}{4}$.—Broken rocky hills rising in steep slopes in SE. $\frac{1}{4}$, sec. 9, brulé with scrub, worthless, small marsh in SE. $\frac{1}{4}$ of sec. 9, if drained would make small area of farm land.

SEC. 9, NE. $\frac{1}{4}$; SEC. 10, NW. $\frac{1}{4}$.—South and west of Eagle river worthless rocky slopes, brulé and windfalls, NE. of river slopes breaking into rough rocky hills in north and east, altitude of workable slopes rises to about 150 feet above the river, sandy clay soil, rather stony, small cedar, spruce, hemlock with much windfall and brulé, some cedars up to 3 feet in NE. corner of NW. $\frac{1}{4}$ sec. 10, 50 to 75 per cent fruit land, part in timber berth 457.

SEC. 19, NW. $\frac{1}{4}$ (S. $\frac{1}{2}$) SW. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Steep slopes and benches rise to the north from the C.P.R. to 500 feet above the Eagle river, between C.P.R. and river, low swamp and marsh, soil clay and sandy loam, old brulé with scrub, bench land 75 per cent fruit value, bottom lands possible farm value, but liable to flood.

SEC. 19, NE. $\frac{1}{4}$ (N. $\frac{1}{2}$); SEC. 20, NW. $\frac{1}{4}$ (N. $\frac{1}{2}$).—In south central part, small area of even bench land about 350 feet above Eagle river, yellow sandy soil with some

stone and gravel, scrub windfall and old brulé, 50 per cent fruit land, steep rocky slopes rise to the north from the bench land.

SEC. 20, NE. $\frac{1}{4}$ (S. $\frac{1}{2}$), SE $\frac{1}{4}$.—Narrow strip of low bench land north of C.P.R. about 50 feet above Eagle river, sandy loam and sand, stony; poplar, birch, and willow scrub, 30 per cent fruit value, south of railway, bottom land exists along the Eagle river, and parts here possible farm value, but much is liable to flood, steep slopes rise south of the river and north of low bench land above.

Tp. 19, R. 5, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 30, NW. $\frac{1}{4}$; SEC. 31, SW. $\frac{1}{4}$.—Rather steep rough slopes rising to about 500 feet above Mabel lake, clay loam, stony and rocky in places, small white pine, fir, birch and poplar, no timber value. Some small benches might be of use for growing fruit, but it is too rough for farming. A small stream through the NW. $\frac{1}{4}$ sec. 30 would give sufficient water to irrigate all good land.

Tps. 19 and 20, R. 5, W. 6th Mer. *T. H. Plunkett, D.L.S., 1910.*

This district is favoured with an ideal climate, frosts being unknown from May until November; and the rainfall seems to be sufficient to render irrigation unnecessary, but even were it not, sufficient water is easily available in every locality. By far the largest area of land adapted to agriculture lies in Frog and Noisy creek valleys. Extending up Frog creek from its mouth in section 27, township 20, range 5, west of the 6th meridian, a distance of 8 miles, there lies a valley with an average width of about 1 mile, admirably adapted to mixed and fruit farming. The soil in the bottom lands along the creek is a rich black loam, while that on either side is brownish loam with a sand or gravel subsoil. The land is very heavily timbered with cedar from 3 to 10 inches in diameter, and the facilities for getting the logs out are good. At Noisy creek there are also some good farm lands, and likewise in sec. 30 of township 19, range 5. Deer, bears, caribou and beaver are very numerous, and marten and mink are also to be found. A fairly good wagon road leads from Enderby to Mabel lake, and the lake permits of navigation throughout its entire length.

Tp. 20, R. 5, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 5, E. $\frac{1}{2}$.—Fractional $\frac{1}{4}$ sections broken by Mabel lake, bench land rising to about 500 feet above Mabel lake, white sandy clay where nearly level, jack pine, fir, hemlock and cedar, mostly small, possible timber value. There is a small bench of good land along the east side of section, sloping to west 230 to 500 feet above the lake, which should be suitable for fruit; it could be easily irrigated if necessary. The remainder is very rough and stony, some gentle slopes in SE. $\frac{1}{4}$ near lake but very stony.

SEC. 20, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$ SEC. 29, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 32, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Rough bench land rising from Mabel lake to about 850 feet above, sandy clay, very stony in places, especially on ridges, timber mostly hemlock, cedar and fir, much small fir, hemlock, willow and alder, lumber value in places, all good timber included in timber berth 237, land as a whole of very little value for cultivation, but there are some narrow strips along streams and some small benches which might be of use. Noisy creek flows through all $\frac{1}{4}$ sections and could be used for irrigation if necessary. At the mouth of Noisy creek in SE. $\frac{1}{4}$ sec. 20, there is a small area of level land only a few feet above the lake which would be suitable for fruit.

SEC. 26, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SEC. 27, SE. $\frac{1}{4}$.—Agricultural land consists of a strip about half a mile wide lying in bottom of Frog Creek valley, land rises gradually from Mabel lake to about 50 feet above, sandy clay and black loam, cedar, hemlock, and some spruce to 2 feet diameter, much willow brush, lumber value, land swampy, 90 per cent farm land if drained. The SE. parts of NE. $\frac{1}{4}$ and SW. $\frac{1}{4}$ sec.

26 are broken by steep rocky slopes covered with old brulé; and the NW. $\frac{1}{4}$ sec. 26 by rocky cliffs and slopes covered with small fir, SE. $\frac{1}{4}$ sec. 27, fractional broken by Mabel lake.

SEC. 27, SW. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ section; easy slopes from lake running back to steep rocky mountain slopes, sandy clay, very stony, small fir, no timber value, of doubtful agricultural value.

SEC. 35, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Low land lying along Frog creek 50 to 100 feet above Mabel lake, broken in the east side by steep rocky mountain slopes covered with old brulé, west side, clay loam, swampy, spruce and cedar in places, much very thick willow and alder, lumber value, farm land 90 per cent if drained. Land rises gradually near base of mountain and some land there would be suitable for fruit.

NW. $\frac{1}{4}$.—Some rolling benches rising to 300 feet above Mabel lake, broken in west by steep timbered slopes, light clay loam, stony in places, hemlock and fir up to 1 foot diameter, much small underbrush, timber value, land rough but might be of use for fruit, value about 20 per cent.

Tp. 21, R. 5, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 1, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land rising very gradually from 100 to 200 feet above Mabel lake, sandy clay loam, very stony toward east, hemlock, cedar with some fir and white pine, 2 feet diameter, lumber value. Land on west side suitable for fruit or farming, could be irrigated easily, value about 70 per cent, land on east, steep stony slopes of mountain with large hemlock, cedar and white pine, timber value.

SEC. 2, SE. $\frac{1}{4}$.—Bench land 100 to 300 feet above Mabel lake, light clay loam, stony in places, hemlock and cedar with some fir and pine 2 feet diameter, lumber value. SE. corner swampy with thick willow brush, 80 per cent farm land, NW. part rather stony bench land, fruit land 45 per cent, all could be easily irrigated.

SEC. 2, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 11, SW. $\frac{1}{4}$.—Bench land 100 to 600 feet above Mabel lake, red sandy clay loam, very stony in places, hemlock and cedar with scattered fir and pine up to 2 feet diameter, land suitable for fruit, could easily be irrigated if necessary, value sec. 2, NE. $\frac{1}{4}$, 60 per cent, NW. $\frac{1}{4}$, 50 per cent, SW. $\frac{1}{4}$ 25 per cent, sec. 11, SW. $\frac{1}{4}$, 30 per cent.

SEC. 11, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 12, W. $\frac{1}{2}$ of NE. $\frac{1}{4}$, W. $\frac{1}{2}$ of SW. $\frac{1}{4}$; SEC. 13, W. $\frac{1}{2}$ of NW. $\frac{1}{4}$, W. $\frac{1}{2}$ of SW. $\frac{1}{4}$; SEC. 14, E. $\frac{1}{2}$ of NE. $\frac{1}{4}$, E. $\frac{1}{2}$ SE. $\frac{1}{4}$.—Bench land 200 to 400 feet above Mabel lake; red sandy clay loam, stony; hemlock and cedar, with some fir and white pine up to 2 feet diameter, lumber value; land consists of level benches about 100 feet above Frog creek on the south, only a few feet above on the north. It would be excellent farm land if it was not stony; it could be readily irrigated from Frog creek; value as fruit land, 60 per cent.

SEC. 24, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$; SEC. 25, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Bench land 300 to 500 feet above Mabel lake, light sandy clay, very stony in places, hemlock with some cedar and fir to 2 feet diameter, lumber value, most of land could be irrigated, broken on west by steep rocky slopes covered with old brulé, and in sec. 24 on the east by rocky timbered slopes, about half of SW $\frac{1}{4}$ and NW. $\frac{1}{4}$ sec. 24, suitable for cultivation, value as fruit land 50 per cent, SW. $\frac{1}{4}$ and NW. $\frac{1}{4}$ sec 25 same value.

SEC. 25, NE. $\frac{1}{4}$.—Bench land about 400 feet above Mabel lake, east half broken by steep mountain slopes, sandy clay loam, hemlock, and cedar to 2 feet diameter, lumber value, some beaver ponds with thick willow brush. East half only suitable for cultivation fruit land 50 per cent.

SEC. 35, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Bench land 400 to 500 feet above Mabel lake, sandy clay, very stony, mostly old brulé, some hemlock and cedar in NE. $\frac{1}{4}$, could be irrigated from Frog creek, good land if not so stony, fruit 40 per cent. On the west side of Frog creek the slopes are very steep and rocky with old brulé, only NE. corner of SE. $\frac{1}{4}$ and E $\frac{1}{2}$ of NE. $\frac{1}{4}$ of agricultural value.

SEC. 36, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land 400 to 750 feet above Mabel lake, sandy clay, much of it very stony, hemlock with some fir and white pine to 2 feet diameter,

possible timber value, much old brulé, especially in SW. $\frac{1}{4}$. There are some benches about 500 feet above Mabel lake which could be easily irrigated but they are very stony, fruit, 40 per cent.

Tp. 22, R. 5, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 1, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$.—A narrow strip of land along Frog creek about 10 chains wide, 500 feet above Mabel lake, clay loam, cedar and hemlock to 2 feet diameter, timber value, land along creek would class about 50 per cent for fruit. To the northwest there are steep rocky slopes with old brulé and on the southeast, steep rocky slopes with hemlock, cedar and fir.

Tp. 23, R. 5, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 22, NE. $\frac{1}{4}$.—Rolling slopes at north, in places rough, rising from the Eagle river to an altitude of about 600 feet above it, soil brown clay loam 6 inches subsoil sandy clay with stone in places, scrub and dead timber, brulé, 50 to 75 per cent fruit land, irrigation if necessary easily obtained, south of river, steep rocky slopes, in timber berth 45.

SEC. 22, NW. $\frac{1}{4}$.—Bottom land along river with slope in NE. corner and steep rocky slopes in S. $\frac{1}{2}$, soil in bottom rich black humus with yellow loam in NE. corner, swamps in places, thick scrub and dead timber, brulé, bottom land 30 per cent farm land but liable to flood, in timber berth 45.

SEC. 23, NW. $\frac{1}{4}$.—Bench land from 100 to 800 feet above the Eagle river, soil yellow loam with clay subsoil, and sandy loam in places, small scrub and dead timber, brulé, south $\frac{1}{2}$ 50 per cent fruit land, north $\frac{1}{2}$ 50 per cent farm land, in timber berth 45.

SEC. 26, SW. $\frac{1}{4}$.—Sloping bench land from 600 to 800 feet above the river in SW. corner, steep slopes rising to NE., soil yellow loam and clay subsoil, scrub and dead timber, brulé, 50 per cent farm land, in timber berth 45.

SEC. 27, SE. $\frac{1}{4}$.—Slopes and rolling bench land from 80 to 600 feet above Eagle river, soil brown clay loam and yellow sandy loam, gravel in subsoil, small scrub and dead timber, brulé, 50 to 75 per cent fruit land, north part rough and worthless, in timber berth 45.

SEC. 27, SW. $\frac{1}{4}$.—Slopes some of which are very steep rise from the river north to an altitude of 600 feet above it. South of river swamps occur and extend to foot of steep rocky slope, soil at north is generally brown or yellow loam with some stone and gravel scrub and dead timber, brulé; SE. part 50 to 75 per cent fruit land, balance of land worthless, in timber berth 45.

SEC. 33, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$ (S. $\frac{1}{2}$).—Bottom land along C.P.R. with slopes and benches rising therefrom, altitude rises to 500 feet above Eagle river, Crazy creek breaks the south $\frac{1}{2}$ of SE. $\frac{1}{4}$, soil on high lands generally brown sandy loam and stony, on low lands, cedar up to 8 feet diameter and hemlock, good lumber, much scrub, on high lands small growth fir, poplar, cedar, hemlock and birch, bottom lands in places of 50 per cent farm value, but liable to flood, bench land about 75 per cent fruit value, in timber berth 45.

SEC. 29, NE. $\frac{1}{4}$.—Steep hillsides generally covered with large boulders and solid rock showing in places, some small benches in NW. part suitable for fruit, thick growth small poplar, birch and hemlock, of no lumber value, fruit land 50 per cent value, included in timber berth 45.

NW. $\frac{1}{4}$.—Steep slopes on south covered with large boulders, bench land on north and a few acres of bottom land in NW. corner suitable for fruit, covered with hemlock, cedar, birch and poplar and brush, of some timber value, generally small, fruit land 50 to 75 per cent value, in timber berth 45.

SEC. 30, NE. $\frac{1}{4}$.—Bottom land along river to north, flooded in high water, and some bottom land to south, rough bench land rising to 400 feet above river, steep slopes strewn with boulders to SE., sandy loam, hemlock, fir and cedar to 10 inches,

a few large cedars 30 inches in bottom land, of timber value, bottom land, 50 per cent farm, requires to be drained, bench land, 50 to 75 per cent fruit, included in timber berth 45.

NW. $\frac{1}{4}$.—Bottom land along river, very swampy on south, good fruit land to north, steep slopes, very rocky in N.W., rough bench land to south, sandy loam, large cedar on bottom land south of river hemlock fir and some cedar to 12 inches on south slopes, of timber value, no timber value to north, old brulé, fruit land 50 to 80 per cent, included in timber berth 45.

SW. $\frac{1}{4}$.—Bottom land in NW. part very swampy, steep slopes, small area of bench in NE., slopes covered with large boulders to south, sandy loam bottom land good farm land if drained, 75 per cent, included in timber berth 45.

SEC. 31, SE. $\frac{1}{4}$.—Bottom land along river, very swampy, flooded in high water, bench land to 600 feet above river, sandy loam, fir and hemlock 10 inches on lower slopes, large cedar 30 inches on bottom land, of timber value, small on higher slopes, bottom land, 75 per cent, if drained bench land 50 to 90 per cent fruit, included in timber berth 45.

SW. $\frac{1}{4}$.—Bench land to 450 feet above river to east of north fork, bottom land to west, rocky slopes to west quarter, sandy loam, old brulé, small fir, hemlock and poplar of no timber value, bench land 90 per cent value for fruit, included in timber berth 45.

NW. $\frac{1}{4}$.—Steep rough hillsides, rising from North Fork, some small benches of doubtful value as fruit land, sandy loam, fir and hemlock to north part to 15 inches good timber value, small to south, old brulé, included in timber berth 45.

SEC. 32, SE. $\frac{1}{4}$.—Low and very wet bottom land to north of river to foot of mountain, slopes very steep and rocky in places, bottom land flooded in high water; could not be drained, south of C. P. R., solid rock hills rising to bench land, none on this quarter, low land north of C. P. R. to river, suitable for farming, sandy loam and gravel, small fir and hemlock on hills, small poplar, birch, cedar and hemlock; some cedar of large size of some timber value, farm land 50 per cent value, included in timber berth 45.

SW. $\frac{1}{4}$.—Bottom land low and wet to south of river, rocky slope in SE. part with small piece bench land on summit, bottom land to east side north of river, very low and wet, flooded in high water, low bench land to west and along foot of slopes, slopes to north very steep rising to 600 feet above river, sandy loam and gravel, small size fir, generally birch, poplar, hemlock and cedar and very thick undergrowth on bottom land, some large cedar of timber value, farm land 50 per cent value, fruit 25 to 45 per cent value, included in timber berth 45.

Tp. 19, R. 6, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 5, NW. $\frac{1}{4}$.—Rolling bench land 300 to 800 feet above the Shuswap river, sandy clay, much gravel and stone in places, hemlock, cedar and fir to 18 inches diameter, lumber value, part rather rough for farming, but there would be some land suitable for fruit or farming, value as farm land, 30 per cent. A stream from Hidden lake runs through $\frac{1}{4}$ section.

SEC. 5, SW. $\frac{1}{4}$; SEC. 6, SE. $\frac{1}{4}$.—Bench land about 800 feet above the Shuswap river, nearly level, sandy clay loam, hemlock, cedar and fir to 18 inches diameter lumber value, good farm land, value about 70 per cent, could not be easily irrigated.

SEC. 6, NE. $\frac{1}{4}$.—Bench land 375 to 800 feet above the Shuswap valley, soil sandy clay, very stony in places, hemlock and cedar with some fir and pine to 18 inches diameter, lumber value, part of quarter would make good farm land, value about 50 per cent, lower portion could be easily irrigated by water from Hidden lake.

SEC. 6, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough hilly bench land 800 feet and upwards above the Shuswap river, sandy clay, very stony, hemlock, cedar and fir to 18 inches diameter, lumber value, no agricultural value.

SEC. 7, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land 60 to 600 feet above the Shuswap river, clay on north changing to sandy loam with gravel and stone to south, timber, cedar and

hemlock on north part and small hemlock on south, lumber value. The north halves of both $\frac{1}{4}$ sections are suitable for fruit and farming, value about 70 per cent. The south half of SW. $\frac{1}{4}$ is rather rough for farming and not so well suited for fruit. There is a small stream in the SW. $\frac{1}{4}$.

NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SOUTH OF SHUSWAP RIVER.—Bottom land rising to bench land 250 feet above the Shuswap river, soil, clay, cedar and hemlock, most of good timber cut off, land suitable for fruit growing or farming, would class about 75 per cent farm land and 60 per cent fruit land.

SEC. 8, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Mostly bottom land rising to bench land about 275 feet above the Shuswap river, most of land is not more than 50 feet above the river, soil, clay, cedar and hemlock to 2 feet diameter, lumber value, farm value 90 per cent, much of it rather damp for fruit. The quarters are broken by the Shuswap river. On the part of the NW. $\frac{1}{4}$ north of the river there is a squatter named N. Simard, and on the NE. $\frac{1}{4}$ north of river, another named Rorke.

SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land 60 to 500 feet above the Shuswap river, sandy clay with gravel and stone in places, hemlock and cedar, possible lumber value rather rough for farm land, value as fruit land about 50 per cent, it could probably be irrigated by water from Hidden lake.

SEC. 9, NW. $\frac{1}{4}$.—Bottom land rising to bench land 500 feet above the Shuswap river, light clay to clay loam, hemlock, cedar and fir to 2 feet diameter, lumber value, good bottom land in NW. corner fruit or farm land, value about 75 per cent.

SEC. 9, NE. $\frac{1}{4}$; SEC. 10, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Rolling bench lands, most of land 100 to 550 feet above the Shuswap river, the NE. $\frac{1}{4}$ sec. 9 and NW. $\frac{1}{4}$ sec. 10 are broken in the south by steep timbered slopes, soil, light clay, hemlock with some cedar, fir and white pine to 18 inches diameter lumber value, NE. $\frac{1}{4}$ sec. 9, fruit land 65 per cent, NW. $\frac{1}{4}$ and NE. $\frac{1}{4}$ sec. 10 fruit land 40 per cent, water for irrigation purposes could be brought from Hidden lake.

SEC. 10 SE. $\frac{1}{4}$.—Rough bench land 100 to 800 feet above Mabel lake, light sandy clay, hemlock with some fir and pine to 18 inches diameter, lumber value, rather rough for cultivation, but some small benches might be of use for fruit.

SEC. 13, E. $\frac{1}{2}$.—A rough rocky ridge rising to about 500 feet above Mabel lake, sandy clay, very stony and rocky, much fir up to 1 foot diameter, possible timber value, land of no agricultural value.

SEC. 14, NE. $\frac{1}{4}$.—Bench land 100 to 300 feet above Mabel lake, very sandy clay, old brulé overgrown with willow brush, etc., on west side, rather steep slopes on east with fir and cedar, lumber value. There is some good fruit land in $\frac{1}{4}$ section if not too dry, there is a lake about $\frac{1}{4}$ mile long and 10 chains wide in $\frac{1}{4}$ section, but it lies too low for irrigation purposes.

SEC. 15, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land rising from the Shuswap river to about 200 feet above, sandy clay loam without much stone, hemlock with fir and cedar to 18 inches diameter, lumber value, some excellent benches for fruit, value about 75 per cent, land could be irrigated if necessary by water from Hidden lake. There is a squatter, R. McDonald, on the SW. $\frac{1}{4}$.

SEC. 16, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SOUTH OF SHUSWAP RIVER.—Fractional quarter sections, bottom land by the Shuswap river rising to bench lands about 200 feet above, soil, light clay and clay loam, hemlock with some fir and cedar to 18 inches diameter value as fruit land about 60 per cent in SE. $\frac{1}{4}$, SW. $\frac{1}{4}$ is better suited for farming.

SEC. 16, NE. $\frac{1}{4}$, NORTHERLY 15 CHAINS.—Bench land 290 to 500 feet above Shuswap river, sandy clay, stony, old brulé overgrown with poplar and willow brush, very dry and difficult to irrigate, would be of very little value unless irrigated, fruit land if irrigated 50 per cent.

SEC. 17, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land on south side rising to about 100 feet above the Shuswap river, sandy clay, stony in places, particularly on SE. $\frac{1}{4}$, old brulé with small fir and willow brush, the N. $\frac{1}{2}$ of each $\frac{1}{4}$ is broken by steep rocky hillsides which may be of some use for grazing, the south $\frac{1}{2}$ of SW. $\frac{1}{4}$ would class about 60 per cent for

fruit, the SE. $\frac{1}{4}$ is all rough and would class about 30 per cent fruit growing, is too rough for farming. There are two squatters, R. G. Rorke in SE. $\frac{1}{4}$, and N. Simard in SW. $\frac{1}{4}$. There is no water convenient for irrigation.

SEC. 18, SW. $\frac{1}{4}$.—Some benches and steep slopes rising to 350 feet above the Shuswap river, land badly broken, sandy clay loam with considerable gravel, fir, cedar and poplar in lower slopes, willow brush and poplar on upper slopes, no timber value, poor farm land except near river and on an island between two channels of the river, value 40 per cent. There is a squatter, Louis Simard, on that $\frac{1}{4}$ section.

SEC. 16, N. $\frac{1}{2}$ OF NW. $\frac{1}{4}$; SEC. 17, N. $\frac{1}{2}$, SEC. 18, N. $\frac{1}{2}$.—Mostly steep hillside rising from 200 feet to 1,200 feet above the Shuswap river, sandy clay, very stony and rocky in places, partially open with willow, poplar, small fir and jack pine, no timber value, of some possible value for grazing but otherwise worthless.

SEC. 22, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Bench land 300 to 500 feet above the Shuswap river, sandy clay, very stony in places, especially in NE. $\frac{1}{4}$, very dry and not easily irrigable, old brûlé overgrown with willow and poplar, would make good farm or fruit land if irrigated, particularly the SE. $\frac{1}{4}$, the NE. $\frac{1}{4}$ is broken in the east by Kingfisher creek and by steep rocky ridge on west.

SEC. 23.—Rolling bench land 270 to 600 feet above the Shuswap valley, very sandy clay, stony in places, especially on the east side of the section, old brûlé overgrown with willow and poplar, land cannot be easily irrigated and its value without is very doubtful, if water could be obtained from Kingfisher creek much of it would be suitable for farming and fruit growing, particularly the south side. In the NE. $\frac{1}{4}$ there is a small beaver pond and swamp, the west side of the section is broken by steep stony slopes to Kingfisher creek.

SEC. 24; SEC. 25; SEC. 26.—Rolling bench lands mostly 200 to 1,000 feet above Shuswap valley, very sandy clay with much stone, old brûlé overgrown with poplar, willow, small fir and pine, no timber value, land is very dry without much chance for irrigation, of very doubtful value for agriculture or grazing. On the east side of secs. 24 and 25 the land slopes abruptly to Mabel lake.

Tp. 22, R. 6, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 19, NW. $\frac{1}{4}$.—Small area bottom land in NW. corner near river and low bench land to 90 feet above river, rolling gently, sandy loam with some gravel in places, fir, hemlock and cedar up to 12 inches and a few cedar 40 inches on bottom land, best of timber has been cut; some timber remaining, bottom land suitable for farming, low and liable to be flooded in high water, 90 per cent value, bench land from 50 to 85 per cent fruit, included in timber berth 45.

SEC. 19, NE. $\frac{1}{4}$.—Low bench land to 150 feet above river, SE. $\frac{1}{2}$ of quarter, steep rocky slope, of no agricultural value, sandy loam with some gravel and boulders scattered near foot of steep slopes, fir, hemlock and cedar to 12 inches generally small, considerable part of timber has been cut; timber remaining, not of much value, bench land 40 to 85 per cent fruit, included in timber berth 45.

SW. $\frac{1}{4}$.—Small area of low bench land along north of quarter 80 feet above river, greater part on very steep, rocky slopes, sandy loam and some gravel, boulders along foot of hill, timber generally small, best has been cut, fir and hemlock to 8 inches, bench land 70 per cent fruit, included in timber berth 45.

SE. $\frac{1}{4}$.—Steep rocky slopes of no agricultural value, rising to mountains, fir and hemlock generally of small size, thinly covering, not of much timber value, included in timber berth 45.

SEC. 20, NW. $\frac{1}{4}$.—Rough, hilly country, broken by deep ravine of Yard creek, small benches of possible agricultural value, hills rocky to west of creek, sandy loam and gravel, Yard creek excellent water, 25 feet wide, very swift, fir and hemlock to 12 inches, of timber value.

SEC. 28, W. $\frac{1}{2}$.—Bench land from 200 to 500 feet above river, flanked by steep rough slopes to east and south, suitable for fruit, considerable part of NW. $\frac{1}{4}$ suitable

for cultivation, sandy loam and gravel, large boulders scattered over surface, old brulé for greater part small bushy poplar, fir and hemlock; fir, cedar and hemlock to 10 inches to southern part and to east, of timber value, fruit land 50 per cent to 75 per cent value.

SEC. 29, S. $\frac{1}{2}$.—Rough broken bench land from 70 to 700 feet above river, partially suitable for fruit, fairly level along north and west, Yard creek runs through NW. $\frac{1}{4}$, sandy loam, with some gravel and boulders in places, fir and hemlock generally of small size to 10 inches, of some timber value, fruit land, 40 to 75 per cent value.

SEC. 30, NE. $\frac{1}{4}$.—Bottom land and low bench land to 70 feet above river SE. of river, and bottom land to NW. to railroad; steep slopes in part west of railroad to 200 feet above river, bottom land, low in places and wet, would require to be drained, would make good farm land, bench land in SE. corner suitable for fruit, sandy loam and black loam, large cedar 40 inches and very thick undergrowth on bottom land, fir and hemlock to 12 inches on higher land, of timber value, bottom land 90 per cent farm, bench 75 per cent fruit, included in timber berth 45.

SEC. 30, NW. $\frac{1}{4}$.—Steep slopes for most part west of railroad to 755 feet above river, bottom land in small corner to SE. of river, some rolling bench land in NW. part partially suitable for fruit, sandy loam, very rocky in places on steep slopes, thick small fir, hemlock, poplar and cedar, of no timber value, bottom land 90 per cent farm, bench land 35 to 50 per cent fruit, included in timber berth 45.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bottom land and low bench land to south and east of river, farm land and fruit land, solid rock cliffs to 640 feet above river north and west, of no agricultural value, sandy loam, bottom land, strip along river low and wet, require to be drained, large cedar 40 inches and thick undergrowth on bottom land, fir and hemlock generally of small size to 8 inches, of some timber value, bottom land 90 per cent farm, bench land 45 to 75 per cent fruit, included in timber berth 45.

SEC. 31, NW. $\frac{1}{4}$.—Small benches to south and east, steep slopes to west and north, rising to 950 feet above river, benches suitable for fruit, sandy loam, large boulders scattered over higher slopes, small fir, hemlock, cedar, birch and poplar to 5 inches thick, of no timber value, bench land 35 to 65 per cent value as fruit land, included in timber berth 45.

SW. $\frac{1}{4}$.—Rolling bench land from 120 to 800 feet above river, slopes to NW. very steep, rising to mountains, good creek runs through quarter, sandy loam, a few boulders and some gravel in places, small fir, hemlock, birch and cedar to 5 inches with a few fir and hemlock to 20 inches, of some timber value, bench land 30 to 65 per cent value as fruit, included in timber berth 45.

SE. $\frac{1}{4}$.—Bottom land and rolling bench land to 100 feet above river, hilly on north, bottom land low and wet near river, sandy loam and some gravel, large cedar 36 inches, fir, hemlock, poplar and birch to 20 inches, some timber value, good part of timber has been logged, and is being logged, bottom land 90 per cent farm, bench land 75 per cent fruit, included in timber berth 45.—*B. F. Somerville, squatter.*

SEC. 32, NW. $\frac{1}{4}$.—Bottom land for greater part, knoll 100 feet high in SW., bench land suitable for fruit, bottom land low and wet in places, sandy loam, gravelly to east of river, cedar, hemlock, fir and poplar—some timber of value, farm land 90 per cent value, fruit 80 per cent.

SEC. 33, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Steep rock slopes to east rising to 1,300 feet above river, high rocky hill to 540 feet above river on west, valley of creek between, some bench land suitable for fruit, sandy loam and gravel, large boulders scattered over surface, no timber, old brulé, small poplar, fir and hemlock, fruit land 35 per cent value.

SEC. 33, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Steep, rocky slopes on east, rocky hill running from NW. $\frac{1}{4}$ to north, bench land and land on gentle slopes, suitable for fruit, from 150 to 600 feet above river sandy loam with gravel and large boulders scattered over surface, old brulé, some timber on east, fir and hemlock to 10 inches, not of much timber value, fruit land 30 per cent value.

Tp. 23, R. 6, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 3, NW. $\frac{1}{4}$.—Steep rough hillside covered with boulders and rocky, a small area of bench land in NW. part suitable for fruit, sandy clay and gravel, old brulé, partially open, a small area of green timber, fir, hemlock and cedar in NW. part, of value as timber, bench land 50 per cent value.

SEC. 4, NE. $\frac{1}{4}$.—Bench land, rough and broken in places, steep slopes to SE. covered with boulders rising to 500 feet above river, some good pieces of bench land, sandy loam, cedar, hemlock and fir to 15 inches covering north part of quarter, of good timber value, old brulé on rest of quarter bench land 25 to 75 per cent fruit, included in timber berth 45. Otto Johnson, squatter.

NW. $\frac{1}{4}$.—Bottom land and bench land 10 to 150 feet above river, sandy loam and gravel in places, old brulé, practically no timber of value, bench land, 50 to 90 per cent fruit, included in timber berth 45, schoolhouse on SW. corner.

SE. $\frac{1}{4}$.—Steep rough hillsides covered with boulders to south and east sides, rising to 870 feet above river, some bench land on north and west, sandy loam and gravel, old brulé, no timber of value, bench land 40 per cent fruit, included in timber berth 45.

SEC. 5, FRAC. NE. $\frac{1}{4}$.—Frac. to west of river, bench land to 50 feet above river, cancelled homestead, sandy loam, fir, cedar and hemlock, of some value as timber, considerable portion has been cut, bench land 80 per cent fruit, good stream runs through quarter.

SEC. 6, SW. $\frac{1}{4}$.—Steep slopes rising to mountain, a few acres of low bench land in SE. corner, sandy soil, timber generally small, fir, hemlock and some cedar, not much value as timber, bench land, 75 per cent fruit.

SEC. 8, SW. $\frac{1}{4}$.—Steep slopes to west, small area rough bench land along east side from 150 to 400 feet above river, sandy soil, fir, hemlock, poplar and brush generally small, not of much timber value, bench land 25 to 50 per cent fruit.

SEC. 9, NE. $\frac{1}{4}$.—Bottom land to 60 feet above river, fairly level land, narrow strip to south of river, sandy soil, with gravel subsoil, fir, cedar and hemlock, some poplar and cottonwood along river, 8 inches to 20 inches, good timber value, bottom land 80 per cent fruit, excellent quarter when cleared, included in timber berth 245.

SE. $\frac{1}{4}$.—Bottom land and bench land rising to 220 feet above river, low and wet in places along north and west, with some small sloughs or ponds, sandy loam with gravel subsoil, fir, cedar, hemlock, some poplar and cottonwood up to 20 inches of some value for timber, has been logged to some extent, whole quarter suitable for cultivation with exception of sloughs, which would be difficult to drain, as they are near level of river, value 40 to 75 per cent fruit, included in timber berth 45.

SW. $\frac{1}{4}$.—Fractional quarter broken by Eagle river, bottom land rolling, a few sloughs, some with depth of water 5 feet, difficult to drain, land on higher parts suitable for fruit, sand and gravel, stony in places, old brulé, cottonwoods along river, no timber value, 60 per cent value as fruit land, included in timber berth 45.

SEC. 10, NE. $\frac{1}{4}$.—Bottom land, swampy and wet to east side, low strip of land to south of river, suitable farm land if drained, land higher to west and north of quarter, suitable for fruit, sandy loam, some gravel and small boulders, very little bush on quarter north of river, no timber value, fir and hemlock to south, 15 inches of timber value, farm land 50 per cent value, fruit 75 per cent, included in timber berth 45. W. Gill, squatter.

S. $\frac{1}{2}$.—Rolling bench land rough and steep to southeast, rising to 825 feet above river, bench land partially suitable for fruit, particularly in SW. $\frac{1}{4}$, narrow strip bottom land along river, low and wet, flooded in high water, slopes to SE. covered with boulders, a good creek, suitable for irrigation if required, runs through section, sandy loam, very stony in places, fir, hemlock and some cedar to north and west, good timber value, 15 inches average, brulé to SE., bench land 25 to 75 per cent fruit, included in timber berth 45.

SEC. 11, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough, steep, broken slopes covered with large

boulders, a narrow strip of low wet land, flooded in high water, of doubtful value as farm land very small area of bench land along small creek in SW. $\frac{1}{4}$, very stony, doubtful value as fruit land, a fringe of green bush along river, poplar, hemlock and cedar, old brulé, no timber.

SEC. 13, NW. $\frac{1}{4}$.—Bench land rising to 200 feet above river and steep slopes covered with boulders, rising to mountains to south and east, bench land suitable for fruit, about one-fourth of quarter, sandy loam, old brulé for greater part, not grown up, cedar, hemlock, poplar and cottonwood, 8 inches to 20 inches, good value as timber, greater part has been logged, bench land 50 to 90 per cent value as fruit land, included in timber berth 45.

SEC. 14, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bottom land along river on both sides, reaching to railway on north, bench land to north of railroad to 160 feet above river, steep rough slopes on south of river covered with boulders, of no agricultural value, bottom land very swampy and wet with sloughs would make good farm land if drained, bench land to north of railroad partially suitable for fruit, sandy loam, gravel subsoil, large, cedar, hemlock and birch on bottom land, of timber value, small fir and hemlock to north of railroad and old brulé to south of river, bottom land 75 per cent farm if drained, bench land 75 per cent fruit.

SEC. 15, NW. $\frac{1}{4}$.—Bottom land and bench land rising to 800 feet above river, bottom land of small area in SW. corner, wet, beaver meadow, easily drained, bench land rough and steep, no agricultural value, sandy loam, large cedar 36 inches on bottom land and a few fir 15 inches on bench land, generally small poplar and hemlock, of timber value, bottom suitable for fruit when drained, 75 per cent value.

SE. $\frac{1}{4}$.—Bottom land, a number of large ponds of varying depths to 4 feet, land suitable for fruit on higher places, sandy loam and some gravel, generally small poplar and hemlock, some large cedar of timber value in NW. part, cancelled homestead, fruit land 65 per cent.

SW. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Bottom land and bench land rising to 165 feet above river, all suitable for fruit when cleared, and low parts drained, sandy loam, covered with large cedar 40 inches, hemlock and fir 20 inches, of profitable timber value, fruit land 75 per cent value, included in timber berth 245 large creek runs through fraction from the west.

SEC. 16, SE. $\frac{1}{4}$.—Bench land from 45 to 400 feet above river, steep and rough in NW. corner, fairly level and suitable for fruit over greater part of quarter, sandy loam, fir, cedar and hemlock 20 inches, of timber value, small fir, hemlock and poplar on steep slopes to NW., fruit land 75 per cent value, included in timber berth 245, fine creek runs through north part of quarter.

SW. $\frac{1}{4}$.—Steep hillside rising to 1,000 feet above river with small area of bench land in SE. corner from 65 to 150 feet above river, suitable for fruit, sandy loam and gravel, fir, hemlock and cedar to 20 inches of profitable timber value on bench land, small hemlock, fir and poplar on steep slopes, included in timber berth 245.

SEC. 22, E. $\frac{1}{2}$.—Rolling bench land from 150 to 1,200 feet above river, considerable part of land along east suitable for fruit, that to west, steep and rough a small area of low wet land along valley of small creek near centre of east side at 555 feet above river, thick brush, sandy loam with some gravel in places, all but part to SE. covered with fir and some hemlock and cedar 20 inches, of excellent timber value, fruit land 40 per cent value, NE. $\frac{1}{4}$, included in timber berth 245.

SEC. 23, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land, considerable part suitable for cultivation as fruit land, from 60 to 820 feet above river, sandy loam with gravel in parts, particularly in NE. quarter, generally small scrubby fir, hemlock and poplar, fir, hemlock and cedar to west of creek in NW. quarter and NW. part of SW. quarter to 20 inches of excellent timber value, fruit land 25 to 50 per cent. Craigellachie creek runs through section.

SEC. 24, NE. $\frac{1}{4}$.—Small area of bottom land, low and wet and small area of bench land suitable for cultivation, steep slopes covered with large boulders cover rest of quarter, sandy loam and gravel, large cedar to 40 inches and hemlock and poplar on

bottom land, a few fir on steeper slopes, brulé for greater part, bottom land 50 per cent farm if drained, bench 40 per cent fruit, included in timber berth 45.

NW. $\frac{1}{4}$.—Broken by Eagle river, part to east, low, wet bottom land, flooded in high water, would make fair farm land if cleared and drained. Part to west of river, bottom land, high, rising to bench land to west to height of 250 feet above river, slopes steep and rocky along west boundary, bench land and bottom land to west, suitable for fruit, sandy soil and gravel, large cedar 40 inches, poplar, hemlock of timber value east of river, small fir, hemlock and a few cedar of fair size to west along river, bottom land to east 50 per cent farm, bench land and bottom land to west 40 to 70 per cent fruit, Craigellachie station in this quarter, included in timber berth 45.

SEC. 24, SW. $\frac{1}{4}$.—Bottom land and bench land rising to 250 feet above the river, small piece bottom land to north, low and wet, suitable for farm land, bench land suitable for fruit, sandy loam soil, cedar, fir, and hemlock 20 inches, greater part has been logged bottom land 50 per cent farm, bench land 75 per cent, included in timber berth 45.

SE. $\frac{1}{4}$.—Steep rough slopes strewn with boulders, worthless a small area of bench land suitable for fruit in NW. corner, sandy loam, old brulé, small poplar, fir and hemlock, of no timber value, fruit land, 50 per cent value, included in timber berth 45.

SEC. 25, NE. $\frac{1}{4}$.—Small area of bottom land rising to bench land 100 feet above, remainder steep and rocky slopes rising to mountain, sandy loam, thinly covered with boulders, old brulé along railroad, small poplar, hemlock, cedar, fir of no timber value, land 40 to 75 per cent fruit land, included in timber berth 45.

SE. $\frac{1}{4}$.—Eagle river runs through middle of quarter, to south, bottom land to foot hill, slope very steep, rocky in places, to 400 feet above river, sandy loam, bottom land low and wet and covered with large cedar and hemlock, of timber value, fir and hemlock 20 inches on slope to south, to north of river, narrow strip of bottom land rising slowly to 100 feet at foot of steep rocky slope, brulé, no timber of value, land to north 40 to 75 per cent fruit, to south 50 per cent farm land, included in timber berth 45.

SW. $\frac{1}{4}$.—Strip of bottom land to north of river, rising slowly to foot of steep rocky slope, sandy loam and small boulders, brulé, a few fir, hemlock and cedar, not of much timber value, 40 per cent to 75 per cent fruit, included in timber berth 45.

SEC. 26, S. $\frac{1}{2}$.—Rough rolling bench land from 215 to 1,100 feet above Eagle river, partially suitable for cultivation on south, steep rough slopes falling to river on east side, sandy loam, very stony in parts, particularly to north, old brulé, small fir, poplar and hemlock, some fir, hemlock and cedar to 20 inches to west, of good timber value, bench land 25 to 45 per cent value as fruit land.

Tp. 18, R. 7, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 7, SW. $\frac{1}{4}$.—NW. part almost flat, swampy, balance is steep hillside, altitude of flat from 935 to 1,080 feet above Shuswap river, soil is sandy loam with stone in places, cedar in flat up to 4 feet, birch, larch, cottonwood, fir, hemlock and white pine up to 18 inches, good timber value, much windfall, flat is 25 per cent farm land, hillside is too rough for cultivation; irrigation not necessary.

NW. $\frac{1}{4}$.—Nearly all rough hillside, altitude from 515 to 935 feet above Shuswap river, clay loam stony and gravelly, timber consists of pine, hemlock, birch, fir, cedar and larch up to 18 inches in diameter, brulé in places and much fallen timber, fair timber value, flat of SW. $\frac{1}{4}$ extends for short distance into this $\frac{1}{4}$ and has value of 25 per cent as farm land.

NE. $\frac{1}{4}$.—N. part easy sloping side hill becoming steeper to south, of timber value only, timber consists of pine, hemlock, birch, fir, cedar and larch up to 18 inches.

SEC. 16, N. $\frac{1}{2}$.—Bench land and gentle slopes from 200 to 535 feet above the Shuswap river, soil is brownish sandy loam containing some fine gravel, stony in places, also rocky in NW. corners. In timber berth 238 (2) some good cedar and fir up to 48 inches in S. part, rest of timber is small fir and larch up to 18 inches, with much

windfall and scrub, all of half section ranges from 50 to 75 per cent as fruit land, and may be irrigated easily from streams in section.

S. $\frac{1}{2}$.—Bench land running into steep slopes in south part, altitude is from 430 to 1,070 feet above Shuswap river, N. $\frac{1}{2}$ is bench land from 430 to 600 feet above the river, soil is sandy loam with some clay loam, usually stony and gravelly, in timber berth 238 (2); timber consists of small cedar, larch, hemlock, pine, birch, with frequent large trees up to 36 inches and many windfalls, at present has fair timber value, irrigation easily obtained from small streams.

SEC. 17.—Fairly even sloping bench land with broken slopes along north boundary and steep slopes in S. part, bench land rises from 325 to 585 feet above the Shuswap river, soil consists of clay loam and sandy loam usually gravelly and with stone in places, some rock shows at surface in north part, in timber berth 238 (2); timber consists of larch, cedar and fir up to 20 inches, of fair value, much brulé occurs and thick windfalls in places, has value of 50 to 75 per cent as fruit land, partial irrigation might be had from small streams in the section.

SEC. 18.—Slightly rolling bench land 400 to 570 feet above Shuswap river, except north part which is sloping towards that river and has altitude of 75 to 400 feet above it, clay loam to sandy loam with stone and gravel in many places part of NW. $\frac{1}{4}$ is in timber berth 238 (3); timber larch, fir, cedar up to 20 inches good for ties and poles, with some large cedar in places, but of doubtful value, much thick windfall and dense scrub in places, also some brulé, has value from 30 to 75 per cent as fruit land, sources of irrigation are small creeks in section and Trinity creek, although it would be difficult to irrigate from the latter.

SEC. 19, S. $\frac{1}{2}$, FRAC. S. OF C. G. 326.—Almost level with slope in south part, altitude 15 to 100 feet above Shuswap river, clay loam also sandy loam in places with clay subsoil some gravel in subsoil, timber, large cottonwoods on flat in NW. corner and cedars up to 6 feet with fir, larch, cedar, white pine, birch and hemlock up to 16 inches in south part of section, windfalls and scrub, good timber value, south $\frac{1}{2}$ is about 75 per cent value as fruit land and NW. part about the same as farm land, irrigation if necessary easily obtained from Trinity creek.

SEC. 20, S. $\frac{1}{2}$ FRAC. S. OF C. G. 325 AND SHUSWAP RIVER.—Slopes rising from 30 to 325 feet above the Shuswap river, with flat of cottonwoods and thick scrub along the river, slopes are often broken and rocky but much of land is workable, soil varies but is generally a sandy loam with stone and gravel in places, timber on slopes consists of fir, larch, cedar, white pine, hemlock and birch up to 18 inches and much windfall, small timber value, south part value about 75 per cent fruit land and tract bordering the river 50 per cent farm land, parts of this latter are liable to flood during high water.

SEC. 20, NE. $\frac{1}{4}$, EAST OF RIVER; SEC. 21, NW. $\frac{1}{4}$, SOUTH OF RIVER.—Flats generally with cottonwoods and thick scrub, parts liable to flood during high water other parts 15 to 50 feet above the river, a few small hay meadows throughout, value as farm land about 60 per cent, a small area of land adapted for fruit land in SE. corner of NW. $\frac{1}{4}$ of sec. 21, value 75 per cent, timber on this part fir and cedar of small value.

SEC. 21, NE. $\frac{1}{4}$.—Flats broken by channels in vicinity of the river with rolling slopes in south part, flats 10 to 30 feet above river, and parts liable to flood during high water, slopes 30 to 200 feet above the river, light clay and clay loam, stony in places, in timber berth 238 (2); timber cedar, larch, fir, hemlock and some spruce up to 24 inches and large cottonwoods on flats, thick scrub and windfalls, of timber value at present, slopes here value for about 40 per cent as fruit land and the lower lands about 50 per cent as farm land.

SEC. 21, S. $\frac{1}{2}$.—Rolling slopes with many benches and a small flat in NW. corner, all from 10 to 415 feet above the Shuswap river; soil is generally a sandy loam with gravelly subsoil, often stony, part of SE. $\frac{1}{4}$ is in timber berth 238 (2), timber consists of larch, fir, some birch, cedar, hemlock up to 12 and 18 inches, with much scrub and windfall, timber is valuable for poles and railway ties, slopes with bench have value

of 60 to 75 per cent as fruit land, flat in NW. corner is 50 per cent farm land, well watered by creeks.

SEC. 22, SW. $\frac{1}{4}$.—Rolling bench land and slopes 200 to 530 feet above the Shuswap river, soil is clay loam about 12 inches with clay and stone subsoil, S. $\frac{1}{2}$ is in timber berth 238 (2), and contains fir, larch, cedar, hemlock, white pine and some birch up to 24 inches of good timber value, N. $\frac{1}{2}$ same timber occurs but smaller, value as fruit land 45 to 70 per cent, easily irrigated by stream running through the quarter.

SE. $\frac{1}{4}$.—Rolling bench land and slopes 500 to 700 feet above Shuswap river, soil, clay and sandy loam, stony and rocky in places, S. $\frac{1}{2}$ in timber berth 238 (2), timber consists of fir, larch, cedar, hemlock, white pine up to 24 inches, and is of fair value, part of land is suitable for fruit, and has value of 40 per cent as such, stream through the $\frac{1}{4}$ would give means of irrigation.

NW. $\frac{1}{4}$.—Cottonwood flat with marshes along river and slopes to the south with benches, altitude from river level to 530 feet above it, soil light clay and sandy loam, stony on slopes timber consists of fir, larch, hemlock and cedar up to 24 inches, much scrub and windfall, some good timber scattered throughout, along river part of land is liable to flood, value of farm land 50 per cent, slopes here value as fruit land of about 40 per cent.

NE. $\frac{1}{4}$.—Sloping land, steep in places, 0 to 590 feet above the Shuswap river, soil sandy and clay loam, stony generally, rock outcrops in many places, rock outcrops in many places, timber, white pine, larch, hemlock and cedar up to 20 inches, of fair value, much windfall, value as fruit land from 25 to 45 per cent.

SEC. 23, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Stony and rocky slopes 600 to 1,100 feet above the Shuswap river, soil sandy loam. In timber berth 238 (2), small cedar and hemlock with scattering of fir, cedar, hemlock and white pine to 24 inches, likely of lumber value, value as farm land doubtful.

SEC. 23, NW. $\frac{1}{4}$.—Generally rough stony, rocky slopes from 410 to to 985 feet above the Shuswap river, a small area in NW. corner could be used for fruit land, soil here is sandy loam and stony in places, all in timber berth 238 (2), timber consists of small cedar, fir, larch, hemlock of little value in north part but larger and of fair value in south part.

SEC. 25.—Rolling bench land 800 to 1,150 feet above the Shuswap river, rough on south side, sandy clay, all stony, cedar, fir, white pine and hemlock to 2 feet diameter, lumber value, land is rather high for fruit and is very stony for farm purposes, but the north $\frac{1}{2}$ of section might be of some use, it would be possible to irrigate it by water from stream flowing into Hidden lake.

SEC. 26, N. $\frac{1}{2}$.—Rough bench land rising from 350 to 950 feet above the Shuswap river, sandy clay, all stony and rocky in places, fir, hemlock and cedar to 18 inches, lumber value, land slopes west very steeply in NW. $\frac{1}{4}$, of very doubtful value for fruit growing or farming. The NE. $\frac{1}{4}$, 800 to 950 feet above the valley, might be of value for farming, it could not be easily irrigated, but there is a small stream and swamp in it.

SE. $\frac{1}{4}$.—Stony and rocky slopes with some very stony flats, altitude 790 to 1,090 feet above the Shuswap river, soil, sandy loam with much stone, in timber berth 238 (2), timber consists of fir, cedar, hemlock, larch up to 24 inches in SE. part, and much smaller with brulé in NW. part, all is of doubtful farm land value.

SW. $\frac{1}{4}$.—Generally steep slopes with rock and stone altitude 390 to 985 feet above the Shuswap river, soil, sandy loam, in timber berth 238 (2), timber consists of scattered fir, cedar and larch up to 24 inches brulé and windfalls, timber of rather low value, small area could be used for fruit in west part, value about 25 per cent.

SEC. 27, SE. $\frac{1}{4}$.—Steep stony and rocky slope from east side towards Shuswap river, flats along the river which are liable to flood in high water, slopes are worth less for cultivation, bottom land has clay loam soil and is apt to flood in places, value as farm land about 50 per cent, in timber berth 238 (2), timber consists of fir, larch,

cedar, hemlock up to 18 inches and 20 inches with larger trees on flat, also some cottonwoods, at present has a timber value.

NE. $\frac{1}{4}$.—Steep stony and rocky slope from east side becoming less steep towards river and having flat in vicinity of river which is much broken by water, soil clay and sandy loam stony in most places, in timber berth 238 (2), timber consists of cedar, fir, larch, white pine, hemlock and cottonwood to 48 inches diameter on low lands with smaller trees on slopes of good timber value, much windfall and scrub, lower lands are liable to flood but parts have 50 per cent farm value, while some of higher land on easy slopes has 60 per cent value as fruit lands, partial irrigation may be had from small creek in the $\frac{1}{4}$ section.

SEC. 27, W. $\frac{1}{2}$.—Much land broken by channels in vicinity of Shuswap river and rising in steep rocky stony slopes on west side, bottom lands vary from 10 to 20 feet in altitude above the river, soil is clay and sandy loam, timber consists of cottonwood, cedar, larch and fir up to 24 inches in bottom lands and is good value on slopes west of river, timber is small and scattered and of lower value, much scrub and windfall, slopes are useless for cultivation, while bottom lands run from 25 to 60 per cent as farm land.

SEC. 28, SE. $\frac{1}{4}$ FRAC.—Area of low bench land along the river rising into steep rocky slopes and rocky bench at north, bench land along the river is about 20 to 40 feet above the river and is stony clay and clay loam, a few fir and bull pine up to 24 inches scattered on the slopes, also much small scrub in places, low bench land has 75 per cent fruit value. Peter Gooshen is squatted on this $\frac{1}{4}$ and has made many improvements, and has fruit under cultivation.

SEC. 28, N. $\frac{1}{2}$ OF SW. $\frac{1}{4}$, S. $\frac{1}{2}$ OF NW. $\frac{1}{4}$, S. $\frac{1}{2}$ OF NE. $\frac{1}{4}$; SEC. 29, N. $\frac{1}{2}$ OF SE. $\frac{1}{4}$, N. $\frac{1}{2}$ OF SW. $\frac{1}{4}$; SEC. 28, L.S. 16.—Rocky stony slopes rising rapidly, useless for cultivation, but having a scattering growth of fir and bull pine, also some larch up to 24 inches, possible lumber value, timber is so much scattered that value would be low, scrub, windfalls and brulé also occur.

SEC. 30, SW. $\frac{1}{4}$.—Steep slopes from south rising to 550 feet above the river and becoming more gradual, and then breaks into bench land, soil clay and clay loam, much stone and rock on steep slopes, timber is very scattered, fir and bull pine up to 3 feet in small birch, cedar, spruce and larch, of probable lumber value. Strip of 30 per cent fruit land runs through the north part of $\frac{1}{4}$ section, means of irrigation doubtful.

NW. $\frac{1}{4}$.—Sloping land breaking into steep slopes at north and with small bench in SW. corner, soil is clay and sandy loam with much stone and rock, timber consists of small fir up to 20 inches and small cedar, spruce, larch and birch, much windfall, of rather doubtful timber value, brulé occurs in many places. Flat in SW. corner is about 550 feet above the Shuswap river and of about 30 per cent fruit value.

E. $\frac{1}{2}$ FRAC.—Sloping land with steep slopes in north and south towards Shuswap river, soil is clay and clay loam with much stone and rock throughout the north half, which is useless for cultivation. In S. $\frac{1}{2}$ a small area of 30 per cent fruit land exists just west of C.G. 238, timber is very scattering, fir and bull pine up to 3 feet in diameter in south, with small birch, cedar, spruce, larch and fir in north of doubtful timber value, much brulé and windfalls occur.

SEC. 34, W. $\frac{1}{2}$ NW. $\frac{1}{4}$.—Steep mountain side sloping towards Shuswap river, worthless for cultivation, timber consists of scattering larch, fir, cedar, hemlock and birch up to 16 inches diameter, much brulé and windfall of doubtful timber value.

E. $\frac{1}{2}$ OF NE. $\frac{1}{4}$, AND ALL EAST OF RIVER.—West of river, flat about 10 feet above the river, soil, clay and clay loam with much rich black clay, cottonwood, spruce, cedar and birch up to 24 inches form the timber which is valuable, scrub and windfalls distributed throughout, 100 per cent farm land. East of river steep slopes come down to river except in south part where there is a small slope of 50 per cent fruit land, soil is clay loam with some stone, on this slope, cedars, larch, pine and hemlock of large size exist and are of timber value.

SE. $\frac{1}{4}$ FRAC. EAST OF RIVER.—Steep slopes in east, becoming more gradual towards river, altitude rises to 360 feet above the river, soil is clay loam and stone, also some sandy loam, timber consists of cedar, larch, pine and hemlock up to 24 inches, and some cedar up to 36 inches along the river, on steeper slopes, timber is smaller, slope along river is about 50 per cent fruit land, and there is a small area of farm land broken by channels in SW. part; this is liable to flood and of very low value.

SEC. 35; SEC. 36.—Rough rolling bench land rising steeply from the Shuswap river in NW. corner of sec. 35, very little of the land is less than 800 feet above the river, sandy clay, stony and rocky hemlock with some fir, pine and cedar, timber value, especially along the south side, part of which is included in timber berth 238, block 2. The only land of any possible agricultural value is the southerly 20 chains of both sections, but this is very stony and could not be irrigated.

Tp. 19, R. 7, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 1.—Rough bench land and steep slopes, very high, much small hemlock with some cedar, fir and pine, doubtful timber value, sandy clay, stony, no agricultural value.

SEC. 2, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SOUTH OF SHUSWAP RIVER.—Steep rocky slopes rising from the Shuswap river, hemlock, fir and cedar, possible timber value, sandy clay, very rocky and stony, no agricultural value.

SW $\frac{1}{4}$, NORTH OF SHUSWAP RIVER.—Bottom land rising to 50 feet above the Shuswap river, a small part in NW. corner broken by steep rocky slopes, bottom land, clay, small fir, cedar, hemlock and birch, no timber value, farm land or fruit land, 65 per cent. There is a squatter by the name of Wm. Roddau on the $\frac{1}{4}$ section.

SEC. 11, NW. $\frac{1}{4}$ SW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Steep rocky slopes rising from bottom land about 40 feet above the Shuswap river in the SE. part, sandy clay loam, very stony and rocky, fir, hemlock, larch and cedar, mostly small scattered fir to 20 inches, possible timber value. The only land of any agricultural value is about 20 acres of bottom land in the SE. corner of the NW. $\frac{1}{4}$, soil, clay, stony in places, value as fruit or farm land about 50 per cent.

SE. $\frac{1}{4}$.—Fractional $\frac{1}{4}$ broken on SE. by the Shuswap river and steep cliffs beyond North of river chiefly bottom land rising to about 80 feet above the river. A small part of NW. corner is broken by steep rocky hillsides, clay very stony in places, small cedar, fir, tamarac and birch, no timber value, value as fruit or farm land about 60 per cent. The quarter section is occupied by a squatter named J. Nordlaw.

SEC. 12, NW. $\frac{1}{4}$ NE. $\frac{1}{4}$, LYING NORTH, OF THE SHUSWAP RIVER.—Bottom land rising to about 70 feet above the Shuswap river, sandy clay to clay loam, much of it very stony, scattered fir and hemlock to 1 foot diameter, good timber has been cut off and land burned over, would class about 60 per cent for fruit or farm land, could be irrigated by water from Cooke creek. A squatter named C. A. Wallin has taken up the NW. $\frac{1}{4}$.

NW. $\frac{1}{4}$, SOUTH OF SHUSWAP RIVER, SW. $\frac{1}{4}$.—Bottom land 5 to 10 feet above the Shuswap river, south half of SW. $\frac{1}{4}$ is broken by steep rocky slopes of mountain, bottom land, light clay rather swampy, cedar and hemlock, partially cut out, lumber value, too wet for fruit, value as farm land about 90 per cent.

NE. $\frac{1}{4}$, SOUTH OF THE SHUSWAP RIVER.—Chiefly bench land rising to about 120 feet above the river, about 20 acres of bottom land near river sandy clay, rather swampy, farm land 90 per cent, bench land, sandy clay loam, slopes rocky, about 20 acres in SE. corner would class about 50 per cent for fruit.

SE. $\frac{1}{4}$.—Bottom land and bench land, about 15 acres low bottom land in NW. corner, value about 80 per cent farm land, bench land sandy clay loam very stony on slopes, South $\frac{1}{2}$ of $\frac{1}{4}$ is broken by steep slopes timber hemlock, cedar and fir, best timber cut off but possible lumber value. About 30 acres of bench in NE. would class about 50 per cent for fruit.

SEC. 13, SW. $\frac{1}{4}$.—Bench land rising from 70 to about 500 feet above the Shuswap river, sandy clay, very stony in places $\frac{1}{4}$ section has been burned over on south and east but there is some cedar, swamp on the west side, timber value on west side, much of land is very dry and would be difficult to irrigate, value as fruit or farm land about 50 per cent.

SEC. 13, NW. $\frac{1}{4}$.—Bench land rising about 500 to 650 feet above the Shuswap river and broken on the NW. by steep timbered mountain slopes, sandy clay loam, stony in places, old brulé with small cedar, fir, birch and willow brush, land would be very dry and difficult to irrigate, 25 per cent fruit or farm land.

NE. $\frac{1}{4}$.—Rough steep hillside rising from 400 to about 1,200 feet above the Shuswap river, broken on the west by a canyon of Cooke creek, sandy clay, stony and rocky, partially open with small fir, poplar and willow, no timber value, no agricultural value, might be of some use for grazing in spring and early summer.

SE. $\frac{1}{4}$.—Mostly rough broken land rising to 425 feet above the Shuswap river, some level land in south side about 70 feet above the Shuswap river, sandy clay loam, very dry and much of it very stony, poplar willow, small fir, etc., old brulé west of Cooke creek, no timber value. A small area in SW. corner could easily be irrigated and would class about 50 per cent for fruit; the remainder is of very doubtful agricultural value.

Tp. 21, R. 7, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 19, NW. $\frac{1}{4}$.—Bottom of small area on lake shore, rising to 150 feet above Mara lake, steep rocky slopes to south and east, rising to mountains, sandy loam, stony and gravel, birch, cedar, fir, poplar and hemlock, no timber of value, land 35 per cent fruit value.

SEC. 30, SW. $\frac{1}{4}$, PART NW. $\frac{1}{4}$.—Steep rocky slopes running to water's edge, in a few places slopes gentle but very stony and rocky, not of much value, sandy loam and rocky, small fir, cedar, hemlock, birch and poplar, no timber of value.

SEC. 31, NE. $\frac{1}{4}$.—Bottom land to NW. part with steep rocky slopes to SW. rising to 890 feet above Eagle river, sandy clay loam, large cedar, hemlock and fir on bottom land, of good timber value, small timber on high land, bottom land 100 per cent farm value, included in timber berth 528.

PART NW. $\frac{1}{4}$.—Bottom land 25 feet above river, all good level land well adapted for farming, sandy clay loam, timber of small size to west, cedar, fir, hemlock, poplar and tamarac, of value as timber, land 100 per cent value as farm, included in timber berth 528.

PART SW. $\frac{1}{4}$.—Bottom land in NW. part, greater part steep, rocky slopes rising to 525 feet above lake, bottom land, good farm land, sandy clay loam, some timber of value on bottom land, cedar, fir, hemlock and small poplar, birch, fir and hemlock on highland, bottom land 100 per cent farm value, included in timber berth 528.

Tp. 22, R. 7, W. 6th Mer. *A. J. Campbell, D.L.S., 1909*

SEC. 4, NW. $\frac{1}{4}$.—Rough, hilly lands with steep slopes, of no agricultural value, from 440 feet above river, up, sand and gravel, small bushy fir, hemlock, cedar and birch with a few scattered fair sized trees, of some timber value.

SEC. 5, NE. $\frac{1}{4}$.—Rough, hilly country from 250 to 980 feet above river, deep ravine of creek running through quarter with steep slopes on each side, small area of bench land to north, suitable for fruit, sand and gravel, fir, hemlock and cedar 20 inches of timber value, fruit land of 35 per cent value.

NW. $\frac{1}{4}$.—Bottom land for greater part, steep slopes on east and SE. rising to 860 feet above river, good creek runs through quarter, sandy clay loam, fir, cedar and hemlock 20 inches, good timber value, bottom land suitable for fruit, but better adapted for farming, farm land 100 per cent value, included, in timber berth, 45.

SW. $\frac{1}{4}$.—Bottom land for $\frac{1}{3}$ of quarter in NW. part, steep rocky slopes rising to 900 feet above river, on rest of quarter, land suitable for fruit in places but low, and

better adapted for farming, sandy clay soil, sandy on slopes and rocky, large cedar 36 inches, fir and hemlock 20 inches of good timber value on bottom, smaller on slopes also poplar on slopes, not of much timber value, farm land 100 per cent value, included in timber berth 528.

SEC 6, NE. $\frac{1}{4}$, SOUTH OF RIVER.—Bottom land rising to 35 feet above river; low in parts, suitable for fruit, but better adapted for farm purposes, sandy clay loam, large cedar 36 inches, fir and hemlock 20 inches, of good timber value, thick undergrowth, farm land 100 per cent value, included in timber berth 45.

SE. $\frac{1}{4}$.—Greater part bottom land, SE. corner on steep, rocky hill, 130 feet above river, suitable for fruit, but low and better adapted for farming, sandy clay loam, large cedars 36 inches, fir and hemlock to 20 inches, good timber value, land 100 per cent value for farming, included in timber berth 528.

FRAC. SW. $\frac{1}{4}$.—Bottom land, rolling on north side of river, low and level to south, farm land to south, fruit on north, sandy clay loam on south, sandy loam to north, timber on north side, small cedar, fir, cottonwood, hemlock and tamarack, on south, fir, hemlock and cedar to 15 inches, and brush, of some timber value, thick undergrowth, part to south of river included in timber berth 528.

SEC. 7, SE. $\frac{1}{4}$.—Rolling bottom land between railroad and river, bench land, rolling, to 400 feet above river, partially suitable for fruit, lower slopes steep with level benches, gentle steady slopes higher, sandy loam and sandy clay loam with some gravel in places, old brulé, small cedar, fir, hemlock and poplar, of no timber value, some timber value on bottom land, cancelled homestead, fruit land 35 to 75 per cent value.

NE. $\frac{1}{4}$.—Rolling bench land, small areas of flat, level benches on lower slopes from 10 to 635 feet above river, partially suitable for fruit, sandy loam with some gravel, old brulé, small scrubby poplar, willow and birch with a few fir, cedar and hemlock, of no timber value, a good creek runs through quarter, fruit land from 35 to 75 per cent value.

NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Some bench land along east, suitable for cultivation from 150 to 760 feet above river, steep slopes to west rising to mountains, rocky in places, sandy loam with some gravel, old brulé, small poplar, cedar, fir and hemlock, some fair timber in small clumps, not of much value, fruit land 35 per cent value.

SEC 8, SE. $\frac{1}{4}$.—Rough bench land broken by gullies partially suitable for fruit, considerable area of level bench land to east and south, to 440 feet above river, sandy loam with boulders in places and with some gravel, fir, hemlock and cedar from 8 inches to 20 inches small poplar, of fair timber value fruit land 35 to 50 per cent value, included in timber berth 45.

SW. $\frac{1}{4}$.—Bottom land for greater part, steep slopes to east to 295 feet above river, land adapted for farming, sandy clay loam, fir, hemlock, cedar and small poplar 8 inches to 25 inches of good timber value, farm land 100 p.c. value, included in timber berth 45.

SEC. 9, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—A few acres of low bottom land in NW. corner, bench land generally, steep slopes with some fairly level benches, particularly in SW. quarter, from 10 to 1,180 feet above river, sandy loam with some gravel, a few large cedars on bottom land, of timber value, small cedar, fir, hemlock, birch and poplar with a few trees of timber value, on slopes and benches, bench land 35 to 60 per cent fruit value.

SEC. 15, NW. $\frac{1}{4}$.—Small area of bottom land in NW. corner with small marshes, steep rough slopes for most part, of no agricultural value, sand and very gravelly, small bushy poplar, fir, hemlock and cedar, of no timber value, bottom land 30 per cent value fruit, included in timber berth 45.

SEC 16, NE. $\frac{1}{4}$.—Bottom land on north and west, rolling, with a number of open sloughs or ponds, fair land on higher ground, steep rough slopes to SE. of no agricultural value, sand and some gravel, small bushy fir, poplar, hemlock and cedar, of no timber value, bottom land 30 to 45 per cent fruit, included in timber berth 45.

NW. $\frac{1}{4}$.—Bottom land, rolling, with some open sloughs or ponds, land suitable for fruit, would be good quarter if sloughs drained, sand and some gravel small bushy

timber, generally a few fir, hemlock and cedar of fair size in clumps, of some timber value, bottom land, 30 to 50 per cent fruit. Eagle river in NW. corner. Included in timber berth 45.

SEC. 17, NE. $\frac{1}{4}$.—Bottom land, rolling, suitable for growing fruit, in NW. corner, rocky slopes, worthless, a few ponds on low parts east of river, sandy soil and some gravel, small cedar, fir, hemlock and poplar, a few trees of fair size, not of profitable timber value, broken by Eagle river, lands 30 to 75 per cent fruit value, part east of river included in timber berth 45.

NW. $\frac{1}{4}$.—Bench land rising to 1,000 feet above river, rocky ridge to SE., slopes higher, gentle and suitable for cultivation and the growing of fruit, sandy loam and some gravel, rocky in places, small poplar, cedar, hemlock and fir, of no timber value, a very few fair sized trees, fruit land, 25 to 50 per cent value.

SEC. 18, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land from 365 feet to 1,200 feet above river, slopes, steeper on north and west, land partially suitable for fruit, sandy loam with some gravel in places, and solid rock showing to west, small cedar, hemlock, fir, poplar and birch of no timber value, a few scattered trees of some value, fruit land, 25 to 60 per cent value.

SEC. 20, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bottom land and low bench land in south corner, steep, rocky slope to NW. This rocky slope runs east from sec. 20 across township, developing into cliffs towards eastern end. Sandy loam and gravel suitable for fruit, small fir, cedar, hemlock and poplar, a few large cedar, fir and hemlock of fair size on bottom land of some timber value, fruit land 25 to 60 per cent value.

SEC. 21, PART NW. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 22, PART NW. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 23, NE. $\frac{1}{4}$, EAST OF RIVER AND SOUTH OF C.P.R.; SEC. 24, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, PART SE. $\frac{1}{4}$, PART SW. $\frac{1}{4}$.—Valley through this part is very narrow with steep slopes on both sides, solid rock cliffs to north and steep broken slopes with considerable rock at eastern end to south, good bottom land and low bench land, parts low and swampy, particularly to north of river, would make good farm land if drained, higher part suitable for fruit, sandy loam, with gravel in parts, cedar, fir, hemlock, poplar and birch, generally of small size, in sec. 24 south of river, timber of value, farm land 75 per cent value, fruit from 40 to 80 per cent value. Part south of river and south half of sec. 21, included in timber berth 45.

Tp. 23, R. 7, W. 6th Mer. *A. O. Wheeler, D.L.S., 1908.*

SEC. 32, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 31, FRAC. NE. $\frac{1}{4}$, FRAC. SE. $\frac{1}{4}$; SEC. 29, NW. $\frac{1}{4}$; SEC. 30, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, FRAC. NW. $\frac{1}{4}$, FRAC. SW. $\frac{1}{4}$.—Highland rising in steps from lake shore to 1200 feet and up, brown, sandy loam with whitish clayey subsoil, stony and gravelly throughout, land largely suitable for cultivation, well watered by small streams and springs in timbered places, portion nearer lake old brûlé with sprinkling of fir and cedar of lumber value, high up on slopes green timber with scattered fir and white pine to 30 and 36 inches in diameter and cedar to 18 inches, of lumber value, but no great body of it any where within the limit of altitude, 1,200 feet, generally land is broken by ravines and area for cultivation would be found only in patches, but these are suitable if they do not dry out too greatly when cleared. The characteristic sharp slope is found adjoining the lake, but is less marked in sec. 31.

Tp. 24, R. 7, W. 6th Mer. *A. O. Wheeler, D.L.S., 1908.*

SEC. 5, NW. $\frac{1}{4}$.—Agricultural portion chiefly bench land, from 175 feet to 400 feet above lake, sandy loam, some good agricultural land, small fir, hemlock, cedar, pine, birch and cottonwood, a strong flowing stream, Queest creek in this quarter section.

SW. $\frac{1}{4}$.—Highland, 270 feet to 360 feet above lake and up, moist sandy loam, some good agricultural land, some Douglas fir and cedar to 2 feet diameter, hemlock and birch, doubtful if of lumber value.

SEC. 6, FRAC. SE. $\frac{1}{4}$.—Generally highland with narrow flat along lake shore, rising to 350 feet above lake, sandy loam, some fair agricultural land, hemlock, cedar and some large fir of lumber value, a squatter named Joseph Gell has built a shack on this quarter section.

FRAC. NE. $\frac{1}{4}$.—Bench land with narrow strip of bottom land along lake shore, rising to 250 feet above lake, sandy loam, stony in parts, fair agricultural land in parts, cedar and hemlock to 2 feet diameter, fir to 3 feet diameter, lumber value.

SEC. 7, FRAC. SE. $\frac{1}{4}$.—Small bit of bottom land, rising to 30 feet above lake, sandy loam, fair agricultural land, small birch, fir, alder and hemlock, Queest creek empties into lake, a squatter named Edward Dollman has built a shack on this quarter section.

SEC. 8, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Agricultural portion chiefly bottom land, from 85 to 250 feet above lake, sandy and clayey loam, stones and rock on higher ground, good agricultural land in lower places, small cedar, fir, hemlock, birch, poplar and pine, bottom land rises to steep mountain side, creek flows through both quarter sections.

FRAC. SW. $\frac{1}{4}$.—Bottom land, bench land and highland, rising above lake to 85 feet on bottom land and 350 feet on bench land, sandy and clayey loam, good agricultural land, nice little creek flows through centre.

FRAC. NW. $\frac{1}{4}$.—Chiefly high land, consisting of a hog's back, rising to 240 feet above lake, sandy loam, rocky, poor agricultural land, small fir, hemlock, birch, alder and poplar.

SEC. 17, FRAC. SE. $\frac{1}{4}$, FRAC. SW. $\frac{1}{4}$.—*A. O. Wheeler, D.L.S., 1908.*—Agricultural portion chiefly bottom land, rising to 150 feet above lake, sandy and clayey loam, rocky in places, some good agricultural land, medium-sized cedar, fir, pine, hemlock and poplar, some cedar and hemlock in southern part to 2 feet diameter. Squatter named William Boyce has built shack on SE. $\frac{1}{4}$ sec. 17, creek flows through SE. $\frac{1}{4}$.

SEC. 18, FRAC. NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, FRAC. SW. $\frac{1}{4}$.—Broken and hilly high land, rising in steps from lake to 1,100 feet above, soil generally brown, sandy loam and stony, some tracts of very suitable land for cultivation, the flats and gentle slopes seem suited for fruit growing, generally old brulé covered by second growth of alder, birch, willow and poplar, practically no timber of lumber value, excepting a strip of half a mile or less on slope adjoining lake front, here fir to 30 inches, white pine to 20 inches and cedar to 24 inches diameter are seen in bunches, two small streams the area and north of it a strong flowing creek has cut a deep ravine; from this, water could possibly be carried; there are a number of small springs here and there throughout, the back portion is very much broken by rocky bluffs.

SEC. 34, FRAC. SE. $\frac{1}{4}$; SEC. 35, FRAC. SW. $\frac{1}{4}$; SEC. 26, FRAC. NW. $\frac{1}{4}$; SEC. 27, FRAC. NE. $\frac{1}{4}$, FRAC. SE. $\frac{1}{4}$.—Bottom land and bench land, bottom land rising to 20 feet above lake, bench land from 20 to 300 feet, to steep mountain sides, soil, light sandy loam generally stony is pretty well broken by ridges and small benches, and on bottom land by old beds of the two streams flowing through it, the best land lies in NE. $\frac{1}{4}$ sec. 27, south of the creek, fair patches of agricultural land may be obtained, some good cedar lies along stream in NE. $\frac{1}{4}$ sec. 27 and NW. $\frac{1}{4}$ sec. 26, but extends back no distance from it, elsewhere timber is hemlock, cedar and birch with occasional Douglas fir, the cedar and fir have a lumber value, near the lake shore all valuable timber has been cut, area is well watered.

W. J. Deans, D.L.S., 1910.—Secs. 18 and 19 of this township slope towards Anstey Arm, but near the lake they drop very abruptly. The soil is clay, sand and gravel. For the most part the surface is covered with brush, but on sec. 19 fir and hemlock suitable for lumber can be obtained. Secs. 6 and 7 sloping also towards Anstey Arm are cut by ravines from 50 to 150 feet in depth. The soil is sand, clay and stones, and the surface is covered with fir, hemlock, and cedar from 12 to 18 inches in diameter. Queest creek crosses the northeast quarter of sec. 6. In the centre of sec. 8 is a rich clay flat covered with small cedar and hemlock and drained by two small streams of good water. The hill-sides, the soil upon which is a mixture of clay, sand and stone, are covered with a

heavy growth of fir, hemlock and cedar, quite suitable for lumber. Queest creek, a mountain stream 10 to 15 links wide but not more than 6 inches deep, except in rainy seasons and spring freshets, crosses the southwest quarter. The volume of flowing water would not be constant enough for the development of much power. The southwestern portion of sec. 17 is formed of sloping benches not more than 50 feet above the lake, while to the north and east the slopes are much higher and steeper. The soil is clay or sand and stones and the surface is covered with small hemlock, fir and cedar. Sec. 21 is a steep mountainside, covered with hemlock, poplar and birch scrub with large trees scattered throughout. This section is of no use for agricultural purposes. A mountainside with narrow benches covered with bush and scattered fir, composes sec. 28. Its soil is sand and clay with stones. The northeast quarter of sec. 27 and the southeast quarter of sec. 34 are in timber berth 241 and in parts are well covered with fir, pine and cedar. The soil is clay and stones and the land rises to the east in benches. Crossing the northeast quarter of sec. 27 in a ravine 50 feet deep is a small creek which empties into Anstey Arm. The western half of sec. 26 consists of slopes and benches. Hemlock and cedar from 10 to 20 inches in diameter cover the northwest quarter, while the southwest quarter is timbered with hemlock and poplar scrub. The soil is sandy clay and rather stony. Two creeks, the most northerly of which flows through a canyon 350 feet deep, and both of which might be made to develop some power, cross this section and empty into Anstey Arm. Sec. 35 consists of steep slopes and benches covered with small fir and spruce and the soil of which is clay and stones. At the northeast corner of the southeast quarter is a small flat bench of clay land. The remainder of this section is a very steep mountainside.

Tp. 25, R. 7, W. 6th Mer. *D. A. Smith, D.L.S., 1910.*

Ready access may be had to this district by boat from Sicamous. The soil varies considerably, much of it being a sandy loam, and suitable for agriculture, but it is doubtful if fruits would prosper, as early frosts are likely to occur. The surface is very broken, especially in the northern portion. To the west of Hunakwa lake, the land rises very rapidly in steep rocky bluffs which fall from the summit to the west in gentle slopes; but to the east of the lake the slopes are more gradual although the surface is broken by ridges, and by the high and irregular banks of Anstey creek. Between Hunakwa lake and Anstey Arm lies a level tract, part of which is flooded at high water. To the east of Anstey Arm the land rises from two to three hundred feet in steep slopes back of which lies a rolling bench of very good land. The valuable timber is set apart in timber berths, or is found in the lot at the north end of Anstey arm, Shuswap lake, but scattered here and there are good fir, cedar, pine and hemlock up to 3 feet in diameter. There is no hay, but fresh water is found in the lakes and in numerous creeks. Anstey creek, if dammed, would furnish considerable power, but the construction of dams would be expensive, and the result would not likely be altogether satisfactory. Wood fuel is plentiful, and game consisting of grouse, bears, deer, lynx, wolverine and several varieties of small fur-bearing animals is found but it is rather scarce.

A. O. Wheeler, D.L.S., 1908.—SEC. 2, NW. $\frac{1}{4}$.—Bench land and high land 400 to 700 feet above lake, soil yellowish sandy loam, stony on high land, rich and swampy on bench land, some good agricultural land, scattering of good cedar to $3\frac{1}{2}$ feet diameter on bench, cedar, fir and hemlock on high land, lumber value.

SEC. 3, FRAC. NE. $\frac{1}{4}$.—Bench land, east half swampy flat, then drier with water running through it, light sandy loam, good agricultural land, 300 to 400 feet above lake, scattered cedar to 3 feet diameter on flat, lumber value, steep, rocky ascent of 300 feet from lake, broken high land, steep, rocky ascent from lake to 400 feet, old brûlé with thick second growth, not suitable for agriculture.

SEC. 10, FRAC. NE. $\frac{1}{4}$.—Bench land, rising in steps, 300 to 400 feet above lake, yellowish sandy loam, generally rocky, poor agricultural land, old brûlé, second growth cedar, hemlock, fir and birch, steep rocky rise from lake of 300 feet

FRAC. SE. $\frac{1}{4}$.—Bench land rising in steps 300 to 400 feet above lake. Description same as for NE. $\frac{1}{4}$. Strong-flowing creek through $\frac{1}{4}$ section, steep, rocky rise from lake of 300 feet.

SEC. 11, NW. $\frac{1}{4}$.—Chiefly high land rising in steps, 300 feet above lake and up, yellowish sandy loam with top dressing of whitish clayey loam, very rocky, east half steep rocky ascent of mountain, unsuited for agriculture, old brulé, second growth poplar, fir, cedar and pine, strong-flowing creek in north part.

SW. $\frac{1}{4}$.—High land and bench land, 400 to 700 feet above lake and up, soil yellowish sandy loam with stones and gravel, some fairly good agricultural land in patches, scattered fir, cedar and hemlock of timber value on high land, on bench land old brulé, strong-flowing creek in south half of $\frac{1}{4}$ section.

SEC. 14, NW. $\frac{1}{4}$.—Bench land and high land, bench land 300 to 500 feet above lake, yellowish sandy loam, stones, gravel and rock throughout, very poor agricultural land, old brulé with thick second growth, sparsely scattered cedar and fir to 2 feet diameter. High lands steep and rocky, unsuited for agriculture.

SW. $\frac{1}{4}$.—High land and bench land, 300 to 600 feet above lake and up, description same as for NW. $\frac{1}{4}$, high land predominates.

SEC. 15, NW. $\frac{1}{4}$.—Bottom land, less than 50 feet above Shuswap lake, light, sandy loam, first-class agricultural land, good cedar, fir and pine, lumber value, within timber berth 241, largest part of $\frac{1}{4}$ section covered by Provincial Grant 707.

FRAC. SW $\frac{1}{4}$.—Bottom land, rising from level of Shuswap lake to less than 50 feet above, light sandy loam, first-class agricultural land, good cedar, fir and pine, luxuriant undergrowth, lumber value, for the most part within timber berth 241, Anstey creek flows through $\frac{1}{4}$ section, largest part covered by Provincial Grant 707.

NE. $\frac{1}{4}$.—Bottom land and bench land, bottom land a series of low, flat benches, 50 to 100 feet above Shuswap lake, traversed by numerous tributaries of Anstey creek, low in places, but easily drained, yellowish sandy loam, more or less stony, good cedar, fir and hemlock to 3 feet diameter, for most part within timber berth 241, bench land rising in steps from 100 to 300 feet above Shuswap lake, yellowish sandy loam, stones, gravel and rock throughout, very poor agricultural land, old brulé with thick second growth, sparsely scattered cedar and fir to 2 feet diameter, western strip covered by Provincial Grant 707.

SE. $\frac{1}{4}$.—Bench land and bottom land, description same as for NE. $\frac{1}{4}$, bench land predominates, strong flowing creek in south half.

SEC. 16, NE. $\frac{1}{4}$.—Bottom land, less than 50 feet above the Shuswap lake, light sandy loam, first-class agricultural land, good cedar, fir and pine, luxuriant undergrowth, lumber value, within timber berth 241, west of Hunakwa creek, steep mountain side.

FRAC. SE. $\frac{1}{4}$.—Bottom land rising from level of Shuswap lake to less than 50 feet above, light sandy loam, first-class agricultural land, cedar, fir and pine, luxuriant undergrowth, lumber value, within timber berth 241, west of Hunakwa creek, steep mountain side.

SEC. 18, W. $\frac{1}{2}$; SEC. 7, W. $\frac{1}{2}$.—Bench land 300 to 600 feet above Shuswap lake, from bench land mountain side rises steeply; soil, sandy loam varying to clayey loam throughout, stony in parts, some good agricultural land, timber, chiefly good hemlock, in lower swampy places good cedar to 3 feet diameter, in valleys good cedar and white pine of lumber value, all in timber berth 241.

SEC. 19.—Bench land 300 feet above Shuswap lake, NE. $\frac{1}{4}$ largely occupied by a small lake 175 feet above Shuswap lake; east of small lake high land, soil, brown sandy loam, some good agricultural land, timber, on bench land small, chiefly second growth, a sprinkling of fir to 2 feet diameter, east of small lake good timber, white pine to 30 inches, fir to 24 inches and cedar to 20 inches diameter, of lumber value, section included in timber berth 241.

SEC. 21, FRAC. SE. $\frac{1}{4}$.—Bottom land, 50 feet above Shuswap lake, light sandy loam, west $\frac{1}{2}$ swampy, but easily drained, first-class agricultural land, large quantity

of good cedar, fir and pine to 3 feet diameter, lumber value, luxuriant undergrowth, within timber berth 241.

SEC. 22, NE. $\frac{1}{4}$.—Broken bench land 300 to 500 feet above Shuswap lake, whitish sandy clay loam, generally stony and gravelly, old brulé, second growth fir, maple, white pine and birch, scattered Douglas fir to 2 feet diameter, in northern portion.

FRAC. NW. $\frac{1}{4}$.—Rolling bench land, 100 to 400 feet above Shuswap lake, whitish clayey loam, good agricultural land. E. $\frac{1}{2}$ old brulé with windfall and second growth, W. $\frac{1}{2}$ open hemlock, lumber value bottom land 50 feet above Shuswap lake, rich sandy loam, swampy but easily drained, a quantity of good cedar, fir and pine to 3 feet diameter, lumber value, within timber berth 241.

SEC. 22, SW. $\frac{1}{4}$.—Bottom land, 50 feet above Shuswap lake, rich sandy loam, first-class agricultural land, swampy, but easily drained, large quantity of good cedar, fir and pine to 3 feet diameter, lumber value. Bench land in NE. corner, 100 feet above Shuswap lake, same as described for NW. $\frac{1}{4}$, SE. portion Provincial Grant 707, balance within timber berth 241.

SEC. 22, SE. $\frac{1}{4}$.—Bench land and bottom land, 100 to 200 feet above Shuswap lake, sandy loam, stony and gravelly on bench land, rich loam on bottom land, bottom land suitable for agriculture, partly covered by timber berth, good fir and cedar, SW. corner Provincial Grant 707, Anstey creek flows through $\frac{1}{4}$ section, irrigable.

SEC. 23, NW. $\frac{1}{4}$.—Broken bench land north of creek, 200 to 500 feet above Shuswap lake, high land ascending from creek on south side for 190 feet and up, sandy loam, generally stony, and gravelly, poor agricultural land, old brulé with small brush and windfall. Anstey creek flows through $\frac{1}{4}$ section, good for irrigation, south of creek rises steeply up mountain side.

SW. $\frac{1}{4}$.—Broken high land, ascending steeply from creek, 190 feet above Shuswap lake and up, soil, sandy loam, rocky, worthless for agriculture, old brulé, second growth cedar, fir, birch and white pine.

SEC. 26, SE. $\frac{1}{4}$.—Rough, broken bench land, 800 feet above lake and up, whitish clayey loam, very stony, old brulé with second growth, practically worthless for agriculture.

SW. $\frac{1}{4}$.—Broken bench land rising to high land, 600 feet above Shuswap lake and up, whitish clayey loam, very stony, old brulé with thick second growth, practically worthless.

SEC. 27, SE. $\frac{1}{4}$.—Rising gently to high land 500 feet above Shuswap lake and up, whitish clayey loam, very stony, old brulé with thick second growth, scattered Douglas fir to 2 feet diameter, poor agricultural land.

SW. $\frac{1}{4}$.—Chiefly high land, 400 feet above Shuswap lake and up, whitish clayey loam, very stony, old brulé with thick second growth, poor agricultural land, stream through northwest corner with good flow.

SEC. 28, FRAC. SE. $\frac{1}{4}$.—Rising uniformly from lake, 100 to 300 feet above Shuswap lake, whitish clayey loam, very rocky, poor agricultural land, old brulé with second growth, stream flowing to lake, good flow, narrow bottom land along lake shore.

SEC. 30.—Uneven bench land 500 feet above Shuswap lake, creek flows through NW. $\frac{1}{4}$, west of creek high land same as sec. 31, soil, on bench land sandy and clayey loam, some good agricultural land, timber: largely burnt, fir, cedar and hemlock with small growth, sprinkling of fir, some large cedar along creek valley, generally poor lumber value, small flat adjoining Beach bay.

SEC. 31.—High land broken by lateral ridges and rocky bluffs, rising to 800 feet above Shuswap lake, general slope to valley of creek, soil brown sandy loam with whitish clayey subsoil, very stony and in parts rocky patches of agricultural land on the slopes and in the hollows, timber, nearly all brulé, a sprinkling of cedar and fir to 3 feet diameter along the valley of the creek, of lumber value, east of creek very little agricultural land.

Tp. 26, R. 7, W. 6th Mer. *P. B. Street, D.L.S., 1910.*

This township lies at the head of Seymour arm of Shuswap lake, and can be reached only by water. A land company, owning several hundred acres of provincial land, runs boats three times a week to accommodate settlers, and the steamers of the Arrow Lake Lumber Company make frequent trips into this district and are very obliging in landing passengers wherever desired. The soil varies from a light sandy loam to heavy clay, the greater part being sandy loam. Most of the available agricultural land is well adapted to fruit growing, and about 50 per cent of the ridges and hillsides would make excellent pasture when cleared. In secs. 7 and 8, timothy and clover were growing luxuriantly, presumably having sprung from seed scattered years ago from a logging camp in the vicinity. The surface is mostly rolling and frequently too broken to permit farming. The southwestern quarter of the township is almost all burned over and is nearly clear, but the remainder is densely timbered with fir, cedar, hemlock, poplar and birch. Considerable fir, white pine and cedar from 12 to 24 inches in diameter is found scattered throughout the wooded portion of the township, and considerable cedar and hemlock of value is standing in the southeastern quarter of sec. 17. There is practically no hay but it can be easily grown on land unsuitable for farming. The township is well watered. Several large creeks and numerous small ones flow into the lake. Most of these rise in springs and flow throughout the summer. The water in these streams, as well as in the lake, is excellent. Water-power could be obtained from some of the larger creeks, but would not be a profitable investment, as much larger streams in the district could be utilized for power purposes and could supply the district much more cheaply. Considerable rainfall occurs in May, June and July. August and September are apt to be dry. No frosts occurred during the summer. No irrigation is necessary. Enough fuel for generations can be obtained on the hillsides to the east of this township. There is more than enough fir, birch and hemlock to supply settlers for years to come. No coal, lignite nor peat deposits were found. No stone easy to quarry or near the lake shore occurs. No minerals, except mica, were found. During a stay of ten weeks no game was seen on land. Grey trout, silver trout and rainbow trout abound in the lake. The annual salmon run provides considerable fish for the settlers who smoke or salt it for winter use.

On June 12, we left Sicamous Junction up Shuswap lake to Cinnemousun narrows through which we passed and proceeded northerly up Seymour arm. This lake is very treacherous and dangerous, as it is subject to sudden and violent storms. The country at the head of Seymour arm is rather rough and for the most part covered with timber. Township 26, range 7, west of the 6th meridian, in which my first work was situated, is made fractional by the boundary line of the Railway Belt which divides the Dominion and Provincial lands. Practically all this township lies on the east side of Seymour arm. The surface is broken by a series of ridges and valleys running northerly and southerly for the most part, the mountain range to the east also following a northerly and southerly direction. The northerly portion of Hunakwa lake lies in section 4 of this township; this lake is fed by creeks to the north and east, and empties into Anstey arm to the south. A well-cut pack trail runs southwesterly from the head of Seymour arm to Hunakwa lake. Along the lake shore the timber is fairly open and easy to walk through, but farther back there is a great deal of second growth cedar and hemlock, which is so dense in places that it is almost impossible to force a passage. The greater part of the south half of this township is rather dry and stony, but irrigation might be successful as two lakes of considerable depth occur in burned, the only timber of any value being some cedar in the southeast quarter of section 17, and a very few scattered white pine and fir in the other sections. Very little marsh or hay land is found in this township, but a small patch in section 16 and sections 5 and 6. The best timber in this township has long since been logged off or another patch in section 21 produce some slough hay of fair value.

None of the settlers in this township have been there long enough to have fruit trees which are producing, but the trees that I saw seemed to be doing well. There are patches of nearly level land varying from 5 to 50 acres which would be suitable for fruit farming, especially small fruits, and if irrigation can be resorted to, probably 50 per cent of this township can be successfully cultivated. The soil varies from a light sandy loam on the ridges to a heavy clay on some of the flat lands, but this clay does not occur extensively. One settler in section 16 showed me some good vegetables grown without irrigation. In sections 7 and 8, where there was once a logging camp, timothy and clover were growing most luxuriantly, which suggests that the ridges unsuitable for fruit or root crops might make very good pasture.

Rain fell freely during June and July, but August was rather dry and very warm. The lake rises until the first week of July and then commences to fall, the water falling rapidly in August. No minerals were found in this township, although small pieces of rock containing good mica samples can be found almost everywhere. About 12 miles north of here there are a great number of claims staked out, and some very good samples of silver and lead ores are brought down every week. The old pack trail to the "Big Bend" country starts at the head of this arm, and the Provincial Government are building another road up to the mining claims.

There seems to be no game in this district, as none of our party saw any grouse, ducks, rabbits or larger game during the ten weeks we were in the district. Some very good trout can be caught at certain seasons of the year, and the annual salmon run provides the settlers with their winter supply of fish, the salmon being easily speared in the shallow water, and either salted or smoked for future use.

Being much less rolling, such crops as fall wheat are raised and yield good results. The uplands, over 3,500 feet above sea-level, are frequently found covered with hay which makes fair pasture. Small fruits do well here but up to the present no fruit trees have proved a success, the trees all beginning to bear profusely in the second or third year and succumbing early. Root crops, however, do well.

A. O. Wheeler, D.L.S., 1908.—SEC. 9.—Bottom land (flat) and high land, flat, 70 to 200 feet above Shuswap lake, soil whitish clayey loam, first-class agricultural land, timber, small birch, hemlock, cottonwood, fir and poplar with thick undergrowth, in southeast $\frac{1}{4}$ sec. 9, some good cedar to 3 feet diameter and hemlock of lumber value, high land easy slopes, good agricultural land, soil, clayey loam; some good cedar to 5 feet diameter and fir scattered through NW. $\frac{1}{4}$ and SW. $\frac{1}{4}$ of section, generally open timber.

SEC. 17 (FRAC.); SEC. 8; SEC. 5; SEC. 7 (FRAC.); SEC. 6 (FRAC.)—With the exception of a narrow flat along the lake shore in sec. 17 which extends back into the northwest $\frac{1}{4}$ of sec. 8, all the land enumerated may be classified as high land broken by lateral ridges and rocky bluffs, rising to 800 feet above Shuswap lake, soil, brown sandy loam with whitish clayey subsoil, very stony and rocky in parts, some fair agricultural patches are met with on the slopes and in the hollows, timber, the largest portion has been burnt over three years ago and most of the standing timber is dead. On flat in NW. $\frac{1}{4}$ of sec. 8 is a bunch of good cedar of lumber value, all the choice lumber along the water front has been taken off, a number of small streams flow from springs along the northwest slopes. This tract of questionable utility for agricultural purposes owing to its rough exterior and the stony nature of the ground. C. A. Bass, squatter on NW. $\frac{1}{4}$ sec. 8 has built a shack on the line between secs. 7 and 8 at the lake shore, berth 241 is within this area.

SEE. 10, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 3, NW. $\frac{1}{4}$; SEC. 4 (FRAC.), NE. $\frac{1}{4}$.—Bottom land and high land, bottom land from 60 feet to 250 feet above Shuswap lake, soil whitish clayey loam, first class for agriculture, low and wet around north end of Hunakwa lake, will need draining, small hemlock, birch and pine with matted second growth, some good cedar and hemlock on southwest $\frac{1}{4}$ of sec. 10 and northeast $\frac{1}{4}$ of sec. 4. within timber berth 241, high land is steep mountainside, soil reddish sandy loam, stony, not good for agriculture.

SEC. 15, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land 300 feet and bottom land 250 feet above Shuswap lake, mountainside occupies east portion, soil, bench land reddish sandy loam, bottom land whitish clayey loam, first-class agricultural land, timber chiefly second growth of hemlock, cedar, birch, pine, cottonwood and alder, a few good cedar of lumber value on flat in SW. $\frac{1}{4}$.

SEC. 18, FRAC. NW. $\frac{1}{4}$, FRAC. SW. $\frac{1}{4}$.—High land rising to 100 feet above Shuswap lake; soil brownish sandy loam with whitish clayey subsoil mixed plentifully with stones and gravel, partly suitable for cultivation; timber, small hemlock and cedar with an occasional white pine and usual brush and scrub, of no lumber value.

SEC. 21, (FRAC.); SEC. 16.—Bench land 300 feet above Shuswap lake, bottom land 250 feet above lake, high land rising to 600 feet, soil yellowish clayey loam, good agricultural land, timber on bench land, second growth cedar, fir, hemlock, pine and birch with undergrowth, on bottom land small with cottonwood, willow and alder, on high land good cedar to 3 feet diameter, and scattered fir of lumber value.

SEC. 22, FRAC. NW. $\frac{1}{4}$, FRAC. SW. $\frac{1}{4}$.—Bottom land, a narrow strip, 250 feet above Shuswap lake, rich brown sandy loam, first-class land, large cedar of lumber value, balance of $\frac{1}{4}$ section high land of very doubtful value for agricultural purposes, $\frac{1}{4}$ section partly covered by Provincial Grant 611.

TP. 18, R. 8, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 1, NE. $\frac{1}{4}$.—Rather steep broken slopes towards Trinity creek, rising from about 630 to 1,320 feet above Shuswap river, stony clay and sandy loam, good deal of brulé, and much windfall, small larch, fir and pine up to 20 inches diameter scattered, much scrub, of little timber value, small flats in SE. corner and along east side which are workable for farm lands, some of slopes might also be used for agriculture, farm land is of 20 per cent value.

SE. $\frac{1}{4}$.—Steep broken hillsides about 800 to 1,320 feet above Shuswap river, clay loam with much stone and rock in places, much brulé and windfall, small growth of larch, fir, pine of no lumber value, small flat of farm land of 50 per cent value on west side and slope of 25 per cent value on north side, irrigation may be had from small stream through southeast part.

W. $\frac{1}{2}$.—Broken by ravine of Trinity creek, steep slopes in west part and almost level bench along centre of east part, bench about 875 feet above Shuswap river, has stony clay loam, much brulé and windfall, no timber of value, but much scrub, bench is of 50 per cent farm value and may be irrigated from creek in SE. corner of section.

SEC. 12, E. $\frac{1}{2}$.—Broken slopes to Trinity creek, no value as farm land, birch, poplar, larch, fir, hemlock and cedar up to 15 inches, fair timber value, brulé in parts. Some cedar up to 48 inches.

SEC. 13, SE. $\frac{1}{4}$.—Bench land except when broken by Trinity Creek valley, from 450 to 515 feet above the Shuswap river, light loam and gravel soil with a light clay subsoil in places, timber consists of larch, fir, and cedar often up to 36 inches, scrub and windfall, brulé in places, east half is of timber value, should be suitable for fruit growing and would have value of 50 per cent, may be irrigated if necessary from Trinity creek.

NE. $\frac{1}{4}$.—Part bench land and part slopes, from 75 to 665 feet above Shuswap river, light loam and gravel soil with some clay subsoil, timber consists of cedar, larch and fir up to 36 inches with scrub and windfall, east half is of timber value, except where broken by Trinity creek is from 50 to 75 per cent value as farm land, irrigation if necessary may be obtained from Trinity creek.

SW. $\frac{1}{4}$.—Bench land below mountain slope about 700 feet above Shuswap river, soil stony loam, timber consists of larch, cedar and fir up to 24 inches and is of good value, bench is of doubtful farm value, possibly 15 per cent.

NW. $\frac{1}{4}$.—Slightly rolling sloping land rising from 170 to 760 feet above Shuswap river, sandy loam soil, stony in places and some rocks, timber consists of larch, fir

and cedar up to 24 inches and is of fair lumber value generally, workable land is suitable for fruit and ranges in value from 25 to 50 per cent as such, irrigation may be obtained from Trinity creek if necessary.

SEC. 14, NE. $\frac{1}{4}$.—Flat in NE. part and rocky slopes in SW. part, altitude is 210 to 760 feet above Shuswap river, sandy loam and clay loam soil, fir, cedar and cottonwood up to 24 inches containing some good timber, workable land is 40 per cent fruit value, means of irrigation is furnished by small stream flowing through the quarter section.

SEC. 22, NE. $\frac{1}{4}$.—North of river, flat, altitude of good land rises to 20 feet above the Shuswap river, sandy and clay loam soil, timber mainly cottonwoods and poplar with some fir and cedar up to 20 inches, north of river soil is suitable for general farming, value 50 per cent and south is too rough and stony, but has some fair timber.

SEC. 23, NW. $\frac{1}{4}$, FRAC. SOUTH OF RIVER.—Flat along river and rising to about 150 feet above the river, soil is clay and sandy clay loam with some stone, larch and cedar up to 20 inches, cottonwoods to 4 feet and scrub forms the growth which is of little value for lumber, part of land along river is liable to flood and high land is good farm land while slopes are suitable for fruit.

SEC. 23, S. $\frac{1}{2}$.—Flat along river with a good deal of hay land, to rear of flat workable slopes rise and meet steep mountain slopes at about 340 feet above the Shuswap river, soil is sandy loam and clay loam, fir, cedar and cottonwood up to 30 inches form the timber, some of which is good lumber value, farm land along the river is of 50 per cent farm value and slopes about 40 per cent fruit value, irrigation if necessary could be obtained from Trinity creek.

SEC. 24, E. $\frac{1}{2}$, SOUTH OF RIVER.—Nearly all level or gentle slopes rising to 170 feet above river, soil is clay and clay loam with sandy loam in places, timber consists of cottonwood on flat, and fir, larch, pine, cedar up to 16 inches with some cedar up to 6 feet, much scrub and windfall, in timber berth 238 (5), much of timber is valuable, land bordering the river is of 50 per cent farm value and balance is from 50 to 75 per cent value as fruit land, irrigation may be readily obtained from Trinity creek.

SEC. 25, E. $\frac{1}{2}$.—Steep rocky slopes at north and south with gradual slope between with many outcrops rising from 100 to 895 feet above Shuswap river, soil is stony sandy loam with many boulders, much scrub and dead timber with some scattering fir up to 24 inches in places and small cedar, poplar and birch in central east side on a flat about 550 feet above the river, N. part of SE. $\frac{1}{4}$ and S. part of NE. $\frac{1}{4}$ is 30 per cent fruit land, but not all workable, small stream running through the section would furnish irrigation for part of land.

SEC. 26, NW. $\frac{1}{4}$.—Gradual slope with steep slope in NE. corner, altitude from 55 to 390 feet above Shuswap river, soil is a sandy loam 6 inches to 12 inches with a slightly gravelly clay subsoil, timber consists of cedar, larch, spruce and fir up to 36 inches with smaller poplar and birch, all good value and in timber berth 238 (3), value as fruit land 70 per cent, irrigation may be obtained from Ashton creek.

SEC. 26, N. $\frac{1}{2}$ of SW. $\frac{1}{4}$.—Almost level and at an altitude of from 40 to 60 feet above Shuswap river, soil, sandy loam with clay subsoil, timber consists of cedar, larch, spruce and fir up to 36 inches with smaller poplar and birch, all good value, in timber berth 238 (3), 75 per cent value as fruit land, Ashton creek furnishes means of irrigation.

SEC. 27, SE. $\frac{1}{4}$, FRAC. NORTH OF RIVER.—Almost level or gently sloping land from 10 to 55 feet above Shuswap river, soil is sandy loam with clay subsoil, timber consists of cedar, larch, cottonwood, spruce and some fir up to 24 inches, good timber value, dense growth of scrub, in timber berth 238 (3), part adjoining the river is 60 per cent farm land and balance is 75 per cent fruit land, well watered. Henry D. Baxter is located on this land.

SEC. 27, S. $\frac{1}{2}$ FRAC., SOUTH OF RIVER.—Gently rising back from river for short distance when steep rocky rise is reached, altitude rises to 125 feet above river, soil is sandy loam, timber on hillside is larch and fir up to 24 inches and of fair value, all flat timber has been logged off, scrub and windfall is also interspersed, lower slope

has value of 50 per cent as fruit land, a couple of small streams would furnish means of irrigation.

SEC. 28, S. $\frac{1}{2}$ FRAC., SOUTH OF RIVER.—All steep rocky mountain side except small cottonwood flat with dense undergrowth in NW. corner, which rises to 10 feet above river; this is liable to flood in parts during high water and would have a fair value as farm land, soil is sandy loam, timber in balance of S. $\frac{1}{2}$ is fir, larch and cedar up to 18 inches and would be useful for railway ties and poles.

SEC. 29, S. $\frac{1}{2}$ FRAC., SOUTH OF RIVER; SEC. 30, FRAC. SE. $\frac{1}{4}$.—Rough, rocky mountain side with cottonwood flats with dense undergrowth in places along the river, soil in these is a sandy loam and altitude is about 5 to 10 feet above the river, parts are liable to flood during high water, value as farm land is about 50 per cent, timber on mountain side consists of fir, larch and cedar up to 18 inches, much of better timber has been logged but some of fair quality still remains in timber berth 238 (4).

SEC. 32, S. $\frac{1}{2}$.—Slopes in many parts rough, altitude from 110 to 610 feet above river, to steep mountain side, soil sandy clay and clay loam, stony in places, timber consists of fir, and bull pine with some larch up to 24 inches, much small fir, cedar and birch in parts, timber berth 238 (3) some of timber is valuable, tract has 20 per cent value as fruit land, water may be obtained from Brash creek.

SEC. 33, S.W. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling slopes, rough in places rising from 100 to 635 feet above Shuswap river, soil is sandy loam with clay loam and stone in places and some rock, in timber berth 238 (3), timber consists of scattering of bull pine, white pine and fir up to 24 inches and smaller growth of cedar, poplar and birch, much of timber is valuable, the quarter has value of from 20 to 40 per cent as fruit land, Brash creek will furnish irrigation.

NE. $\frac{1}{4}$.—Rough, rocky, stony, broken slopes, some scattering fir up to 18 inches, much brulé, useless for cultivation.

SEC. 34, SW. $\frac{1}{4}$ FRAC.—N. part rocky mountain side S. part gradual slope, altitude 110 to 635 feet above river, soil stony sandy clay and some clay loam, timber is fir, cedar and white pine up to 24 inches and is fair value, legal subdivision 4 is of 30 per cent value as fruit land.

SEC. 34, SE. $\frac{1}{4}$ FRAC.—N. part steep slopes, S. part more gradual slope, altitude from 140 to 740 feet above river; soil is sandy loam and rather stony in timber berth 238 (3); much small fir, poplar, jack pine with some large trees, rather poor timber value, parts range from 10 to 50 per cent as fruit land, may be irrigated from Ashton creek.

SEC. 35, SW. $\frac{1}{4}$.—On hillside steep in many places and broken altitude from 390 to 815 feet above Shuswap river, soil is sandy clay and clay loam with stone, growth consists of scrub and small fir, poplar, jack pine and birch with some large trees, fruit should do fairly well in some slopes, value of land as fruit land would be about 20 per cent, irrigation might be obtained from Ashton creek.

SE. $\frac{1}{4}$.—Rather rough slopes broken by Ashton creek, altitude from 390 to 815 feet above Shuswap river, soil sandy loam and very stony in parts in timber berth 238 (6). There is much scrubby growth of fir, poplar and jackpine with scattering of large fir, does not appear to be a very valuable timber quarter, west of Ashton creek, fruit should do fairly well, value as fruit land is 20 per cent.

Tp. 19, R. 8, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 6, E. $\frac{1}{2}$; SEC. 8, E. $\frac{1}{2}$; SEC. 17, S. $\frac{1}{2}$ of SW. $\frac{1}{4}$.—Steep rock slopes broken by rocky cliffs and partially timbered, possible timber value of no agricultural value, mixed timber and worthless land.

SEC. 20, SW. $\frac{1}{4}$.—Steep timbered slopes rising to mountain, sandy clay, very stony, small fir, birch, etc., no timber value, no agricultural value.

NW. $\frac{1}{4}$.—Bottom land in NW. corner about 50 feet above the Shuswap river, rising to steep timbered mountain slopes in SE., partly old brulé, large cedar with some spruce to 18 inches in east side, lumber value, soil, sandy loam stony in places

and swampy on east side, about one-third of $\frac{1}{4}$ section would class about 60 per cent farm land or fruit land if drained, the remainder is doubtful but might be of some use for fruit, it is all included in timber berth 287.

SEC. 29, SE. $\frac{1}{4}$.—Mostly steep rocky hillside rising 200 to 900 feet above the Shuswap river, sandy stony clay, small fir and willow brush, some fir up to 15 inches, possible timber value, no value for farming, but some of the slopes on west side might possibly be of use for fruit.

SEC. 29, NE. $\frac{1}{4}$.—Bench land rising from 200 to 750 feet above Shuswap river, sandy loam, stony, brulé, no timber value, water for irrigating could probably be obtained from a stream through the south part of sec. 33, fruit land 20 per cent.

SEC. 32, E. $\frac{1}{2}$ OF NE. $\frac{1}{4}$.—Steep rocky slopes rising to a bench about 300 feet above the Shuswap valley, very stony and rocky, brulé with some willow brush, no timber value, no agricultural value.

SEC. 33, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rather rough bench land 425 to 900 feet above the Shuswap river, sandy loam, all stony, brulé much of it freshly burned, no timber value, could be irrigated if necessary, rather stony for farm land, fruit 35 per cent.

SE. $\frac{1}{4}$.—Benches and slopes rising 850 feet and upwards above the Shuswap river, sandy loam, very stony, old brulé, some cedar and fir to 12 inches, no timber value, of doubtful agricultural value, very stony for farm land and too high for fruit. could be irrigated.

NE. $\frac{1}{4}$.—Benches and slopes rising from 675 feet above the Shuswap river on the west side to 1,050 feet on the east, sandy loam, very stony, old brulé, some cedar and fir to 12 inches, no timber value, very stony for farm land but might be of use as it could be easily irrigated, the lower slopes and benches might be of use for fruit.

J. E. Ross, D.L.S., 1909.—The land surveyed in this township consists of the northeast quarter of sec. 29 and southeast quarter of sec. 32. The land is sloping and wooded with fir and cedar. Water is hard to get. It is within half a mile of the wagon road, which follows along the east side of Shuswap river, and 4 miles distant from the settlement at Mara. Part of the land has been burned over. The elevation varies from 300 to 700 feet above Shuswap river. Fruit might grow well on the land surveyed. I also made some retracements to locate the boundaries of lot 527, concerning which there was a dispute.

Tp. 20, R. 8, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 3, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Mostly steep slopes 300 feet and upwards above the Shuswap valley, sandy clay loam, most of it very stony, scattered fir and cedar up to 18 inches with much willow, birch, etc., possible timber value, of very doubtful agricultural value, a large stream runs through the NW. $\frac{1}{4}$.

SEC. 4, SE. $\frac{1}{4}$.—Rather steep broken slopes with some benches rising from 160 feet above the Shuswap river at the NW. corner to 1,000 feet above at the SE., sandy clay, stony, fir and cedar up to 18 inches in north timber value, SW. corner recently burned over, most of land too rough and stony to be of agricultural value, a small bench in the SW. corner about 700 feet above the valley might be of use.

SW. $\frac{1}{4}$, EASTERLY 30 CHAINS.—Bottom land 20 feet above the Shuswap river rising to bench land about 700 feet above, sandy clay, stony, brulé recently burned, of no timber value, much of land too rough for cultivation.

SEC. 6, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Very steep rocky hillsides rising to about 1,000 feet above the Shuswap river, sandy stony clay, old brulé, overgrown with scattered willow brush and poplar, small fir in places, no timber value, no agricultural value.

SEC. 6, NW. $\frac{1}{4}$.—High rolling bench land 900 to 1,200 feet above the Shuswap river, light clay loam, much of it stony, especially to south, fir, cedar and hemlock from 6 inches to 2 feet diameter on north side, lumber value, south side, brulé, value 25 per cent as farm land, would be very difficult to irrigate.

SEC. 7, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—SW. $\frac{1}{4}$ rolling bench land 1,050 to 1,200 feet above the Shuswap river, not badly broken, light clay loam, stony in places, hemlock, cedar and

fir 6 inches to 2 feet in diameter, timber value. There is a small stream through NE. corner, but the land would be difficult to irrigate, value 50 per cent farm land. The NW. part of SE. $\frac{1}{4}$ is similar to SW. $\frac{1}{4}$ but the SE. part consists of steep rocky slopes to Shuswap river recently burned over and of no agricultural value.

N.W. $\frac{1}{4}$.—Rolling bench land 1,070 to 1,200 feet above the Shuswap river, light clay loam, rather stony, cedar, hemlock and fir 6 inches to 2 feet diameter, lumber value, the NE. corner is rough and hilly. In the NW. corner there is a small swamp and a low ridge of old brulé, value as farm land about 25 per cent.

SEC. 8, NW. $\frac{1}{4}$.—Steep rocky hillside recently burned over, of no value for agricultural purposes or for timber.

SEC. 9, E. $\frac{1}{2}$ OF SE. $\frac{1}{4}$.—Bottom land 20 feet above the Shuswap river, rising mostly by easy slopes to about 300 feet, sandy clay very stony, especially to south where it has been recently burned, thick underbrush with scattered large fir to north and east, no timber value. It is included in timber berth 402. A large stream flows through the middle and it can be easily irrigated, fruit land 50 per cent.

SEC. 10, SW. $\frac{1}{4}$, E. $\frac{1}{2}$ OF NW. $\frac{1}{4}$.—Rolling bench land 300 to 750 feet above the Shuswap river, sandy loam, stony, old brulé with scattered fir, tamarack and willow brush, no timber value, E. $\frac{1}{2}$ of NW. $\frac{1}{4}$ about 50 per cent and SW. $\frac{1}{4}$ about 40 per cent for fruit. There is a good stream through SW. $\frac{1}{4}$.

SEC. 15, E. $\frac{1}{2}$.—Bench land and easy slopes on west side 300 feet and upwards above the Shuswap river. East side broken by steep mountain slopes, sandy clay and loam, stony, old brulé with poplar willow brush, etc., no timber value, land along west side would class about 50 per cent as fruit land, the N. part of SW. $\frac{1}{4}$ is broken by a wide gravel bed along a creek running through it.

SEC. 15, S. $\frac{1}{2}$ SW. $\frac{1}{4}$.—Bench land 30 to 400 feet above the Shuswap river, light clay loam, stony in places, old brulé with poplar and willow brush, value about 40 per cent as fruit land about half of land is level or slopes gently to west; about half in centre is broken by steep stony hillside rising about 300 feet.

SEC. 17, E. $\frac{1}{2}$.—Mountain slopes, very steep and rocky, timber small and recently burned over, no timber value, land practically worthless.

SEC. 18, SW. $\frac{1}{4}$.—High bench land 100 to 1,200 feet above the Shuswap valley, light clay with some gravel, stony in places, old brulé with some swamp on west, rather steep stony slopes with hemlock, spruce and fir to 18 inches diameter on east, lumber value; included in timber berth 386; west half would class about 60 per cent for farm land, and east half would be doubtful; there is a small stream on the west side.

SEC. 18, NW. $\frac{1}{4}$.—High bench land 1,050 feet to 1,200 feet above the Shuswap valley, light clay with some gravel, stony in places, cedar, fir and hemlock 4 inches to 2 feet diameter on west, lumber value, old brulé with willow and small fir on east, included in timber berth 386. Farm land 50 per cent, the best land is on the west side of $\frac{1}{4}$ section, and there are two small streams through it.

SEC. 19, SW. $\frac{1}{4}$.—Rolling bench land 950 feet and upwards above the Shuswap river, light clay, some stone and gravel, hemlock, fir and cedar to 2 feet diameter, lumber value, included in timber berth 386, some good farm land in SE. corner, would class about 50 per cent. There is a stream through this corner.

SEC. 20, SE. $\frac{1}{4}$; SEC. 21, FRAC. NW. $\frac{1}{4}$.—Mountain slopes, very steep and rocky, poplar and willow brush with fir up to 1 foot, scattered large fir, timber value, included in timber berth 386, on south side of NW. $\frac{1}{4}$ sec. 21, there are a few acres of bottom land which would be of value for growing fruit, would class about 60 per cent, this quarter is partially open and some of the hillside might be of use for grazing, the SE. $\frac{1}{4}$ of sec. 20 is of no value except as timber land.

SEC. 22, E. $\frac{1}{2}$.—Bench land on the west broken by steep rocky mountain slopes on the east, most of bench land is about 150 to 300 feet above the Shuswap river, light loam, stony, old brulé with poplar and willow brush, the west half should class about 60 per cent for fruit, there is a small stream in the SE. $\frac{1}{4}$.

SEC. 26, W. $\frac{1}{2}$; SEC. 27, FRAC. NE. $\frac{1}{4}$.—Mountain slopes, very steep and rocky, fir, hemlock, jack pine, cedar, birch, poplar, nearly all small of very doubtful timber value, no agricultural value.

SEC. 28, WEST OF MARA LAKE; SEC. 33, W. $\frac{1}{2}$ FRAC. SE. $\frac{1}{4}$.—Mountain slopes very steep and rocky, fir, hemlock, cedar, birch and poplar, considerable large fir, timber value, south part of sec. 28 is included in timber berth 386, land is of no value for agricultural purposes, both sections are broken on the east side by Mara lake.

SEC. 34, FRAC. NE. $\frac{1}{4}$, FRAC. SE. $\frac{1}{4}$.—Steep rocky slopes rising from Mara lake to about 400 feet above, small fir, poplar and willow, scattered large fir, possible timber value, included in timber berth 443. There is a small stony flat at the mouth of a creek in the middle of NE. $\frac{1}{4}$, which might be of some value for fruit; the remainder is worthless for agricultural purposes.

SEC. 35, SW. $\frac{1}{4}$.—Steep, stony slopes rising 400 feet upwards above Mara lake, small fir, pine, willow, etc., possible timber value, included in timber berth 443, no agricultural value.

NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Rather steep mountain slopes with a few small benches rising from 400 to 1,200 feet above Mara lake, sandy clay loam, stony, willow, birch, jack pine, small fir and cedar, some fir and tamarack to 18 inches, possible timber value, included in timber berth 443, some benches in NW. $\frac{1}{4}$ 400 to 800 feet above the lake might be of use for fruit, value about 40 per cent, NW. $\frac{1}{4}$ too high for fruit and too rough for farming, both $\frac{1}{4}$ sections could be irrigated.

Tp. 21, R. 8, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 2, E. $\frac{1}{2}$ OF SW. $\frac{1}{4}$.—Bench land 425 to 840 feet above Mara lake, sandy clay loam, stony, small fir, jack pine, alder and larch, no timber value, fruit land 50 per cent, water would have to be brought from stream half a mile farther east.

FRAC. NW. $\frac{1}{4}$.—A few acres of bottom land in north rising to about 40 feet above Mara lake, and a few acres of bench land 400 to 500 feet high in SE. corner, birch, fir and cedar, no timber value, included in timber berth 443, bottom land, sandy clay, 60 per cent farm land, bench would probably grow fruit, remainder steep rocky slopes, worthless.

NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Small benches and more or less steep slopes about 400 to 1,100 feet above Mara lake, light clay loam, stony and rocky in places, small jack pines, fir and cedar with some poplar and willow, very doubtful timber value, included in timber berth 443, some of benches might be suitable for fruit, the north part of NE. $\frac{1}{4}$ is broken by deep rocky canyon and is of no agricultural value.

SEC. 11, SE. $\frac{1}{4}$, FRAC. NE. $\frac{1}{4}$.—Land rising from Mara lake to 500 feet above, light clay loam, very stony and rocky; cedar, fir, hemlock, birch and alder, no timber value. There is a small bench along the east side 350 to 500 feet above the lake which would class about 50 per cent for fruit, and some bottom land along the west side of SE. $\frac{1}{4}$, which would probably be suitable for fruit growing or farming; remainder is of no agricultural value.

SEC. 12, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 13, NE. $\frac{1}{4}$, FRAC. SW. $\frac{1}{4}$, FRAC. NW. $\frac{1}{4}$; SEC. 24, FRAC. SE. $\frac{1}{4}$.—Steep rocky slopes rising from Mara lake to about 1,200 feet above, small fir, cedar, larch, alder and birch, scattered fir, tamarack up to 1 foot diameter, possible timber value, land of no agricultural value.

A. O. Wheeler, D.L.S., 1908.—SEC. 29, LEGAL SUBDIVISIONS 13 AND 14; SEC. 30, LEGAL SUBDIVISIONS 5, PT. 6, PT. 7, PTS. 8, 9, 10, 11, 12, PTS. 14, 15 AND 16.—High land broken by ridges and rocky bluffs rising 400 to 1,000 feet above Shuswap lake, soil, reddish sandy loam, with light whitish clayey subsoil, stony, some good patches of agricultural land, timber: scattered fir, larch, cedar and white pine to 24 inches diameter, of lumber value, included in timber berth 455.

SEC. 30, LEGAL SUBDIVISIONS 1, 2, 3, PT. 4, PT. 6, PT. 7, PT. 8.—Bench land broken by ridges and rocky bluffs, rising to 200 feet above Shuswap lake, soil, reddish sandy

loam, light whitish clayey subsoil, stony, timber generally small, has been logged and best timber taken, very little of lumber value left, included in timber berth 455.

SEC. 32, LEGAL SUBDIVISIONS 5, 6, 11 AND 14; SEC. 31, LEGAL SUBDIVISIONS 1 AND 2. —High land, from 300 to 600 feet above Shuswap lake, rising in steps, soil, light whitish clayey loam, stony and gravelly, rocky as elevation increases, some good agricultural land, timber: Douglas fir, larch, hemlock and cedar, fir and larch to 30 inches diameter, included in timber berth 455.

J. E. Ross, D.L.S., 1909.—The portion of this township surveyed is rather steep and rocky, but there are a few quarter sections well adapted for fruit growing. Several creeks come down the mountain side. One of these is in a deep canyon and has sufficient volume and fall to be well suited for moderate power development if it were ever needed in that portion of the country. The land is convenient to the town of Sicamous by the water route, as it lies along Mara lake. There is no road at present on the east side of the lake. The soil is sandy loam and rock. There is considerable forest along the lake, the timber being chiefly fir, cedar and spruce, while brush grows densely in places.

G. H. Blanchet, D.L.S., 1910.—The Canadian Pacific railway crosses this township from east to west following the southern shore of the Salmon arm of Shuswap lake. The station of Sicamous is situated in section 35 and from here water communication may be had with all parts of the township by way of Shuswap and Mara lakes. The only lands of agricultural value in this township are the lower slopes of the mountains bordering the lakes. The soil here is mostly a whitish clay and rather stony. Good results have been obtained with fruits and garden produce. Some good timber still remains in the northwestern corner of the township but it has for the most part been thoroughly fireswept. Streams are fairly numerous although they do not exist as surface water more than a couple of hundred feet above the lake. The climate is warm in summer and mild in winter, ice seldom forming on the lake. Game is scarce but trout and salmon are plentiful in the lake.

Tp. 22, R. 8, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 1, NE. $\frac{1}{4}$.—Bottom land to SW., steep rocky slopes rising to 700 feet above river, bottom land, rolling, suitable for fruit, some gravel in places, poplar, hemlock, and birch 6 inches to 12 inches, not much timber value, slopes covered with scrubby growth of fir with a very few trees of fair size, land 75 per cent value as fruit land.

SEC. 1, FRAC. SE. $\frac{1}{4}$.—Bottom land, rolling, suitable for fruit, sandy loam, small poplar, birch, tamarack and hemlock, no timber value, land 75 per cent value as fruit land.

FRAC. NW. $\frac{1}{4}$.—Steep slopes with small benches suitable for fruit, to north, slope very steep solid rock, sandy loam and gravel, small fir, hemlock and poplar, a few fir of fair size, 25 to 40 per cent value as fruit land.

PART SEC. 11; PART SEC. 10.—Steep rocky slopes to north of lot 525 G1 in sec. 11 and steep rocky slopes rising from lake shore in sections 10 and 11, sandy loam and rock, scattered fir of small size average 6 inches, of no timber value, of no agricultural value.

Tp. 23, R. 8, W. 6th Mer. *A. O. Wheeler, D.L.S., 1908.*

PART SEC. 8; PART SEC. 5; PART SEC. 6.—An area of broken bench land extends back southerly from 1 to 2 miles with small muskegs scattered through it, its altitude is over 1,200 feet above the lake, all this section has been burned over, the timber is small and until the high green bush slopes to the south are reached has no timber of lumber value, the soil is reddish or brownish sandy loam with white marl clay subsoil, it is traversed by low rocky ridges, if the altitude is not too great some small areas of agricultural land here and there might be utilized, included in timber berth 455.

FRAC. SEC. 17; PART SEC. 16; PART SEC. 8; PART SEC. 6; FRAC. SEC. 18; SEC. 7.—High lands rising^d in easy slopes, separated by sharper ascents, to 1,200 feet above Shuswap lake, soil, whitish, brownish and reddish sandy loam, generally with stones and gravel, white marly clay subsoil, rock near shore, some agricultural land found in places where slopes are easy, if not too dry when cleared of bush, no facilities for irrigation, timber: generally old brulé with scattered fir and larch to 30 inches diameter throughout, more recent burn in sec. 6 and south half of sec. 7, most of the cedar is fire killed, but green trees 18 inches in diameter are found here and there, some rock ridges outcrop in sec. 7, as higher levels are reached, larch predominates and soil becomes more sandy, included in timber berth 455.

SEC. 26, FRAC. NE. $\frac{1}{4}$, FRAC. NW. $\frac{1}{4}$, FRAC. SE. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 27, FRAC. SE. $\frac{1}{4}$, FRAC. SW. $\frac{1}{4}$; SEC. 22, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 23, NW. $\frac{1}{4}$, FRAC. NE. $\frac{1}{4}$; FRAC. SEC. 21.—Broken high lands with a narrow strip of bottom land along shore, rising in steps and small benches from lake to 1,200 feet above, brown sandy and clayey loam, stony near shore, plenty of good agricultural land in patches and small flats here and there; also along the shoulders, timber generally birch, cedar, hemlock and undergrowth with a sprinkling of fir of lumber value throughout, some good cedar to 3 feet diameter near shore in sec. 27 and in sec. 21; in sec. 26 a lot of old brulé with second growth. Ground generally moist, two small watercourses seen, but no flowing creek of any size, included in timber berth 455.

G. H. Blanchet, 1910.—On the completion of the survey in this township, I proceeded on May 27 to township 23, range 8, west of the 6th meridian, which was reached by a gasoline launch from Sicamous.

The portion of this township considered lies between the two arms of Shuswap lake, known as the "Long Traverse" and the "Sicamous Branch," which are joined by the Cinnemousun narrows. It has the appearance of a peninsula, the rib of which starts at the narrows and reaches a maximum elevation of about 1,500 feet above the lake in the southeast quarter of section 22. From here there is a rugged spur which continues south to the lake, making the easterly side steep and rocky. The main ridge, however, swings off to the southwest and, descending and broadening, forms a rolling upland with an elevation of about 1,300 feet in the southwest corner of the township. This small plateau and the declivities and benches by which it descends to the northwest, to the level of Shuswap lake, were the only portions considered to have agricultural possibilities.

The original rocky core is not very deeply buried at any point, and frequently outcrops in bluffs and escarpments, most frequently in the northern portion. A seepage from the northeasterly slopes of the Bastion mountains supplies moisture, and although there are no permanent streams, springs occur at intervals, indicating a probable underground flow.

In the descent from the upper plateau level to the lake, two benches break the steepness of the slope. The first has an elevation of from 500 to 800 feet, and varies in width from over half a mile in the western side of the township to less than a quarter of a mile in section 21. The second bench extends back from the lake shore three-quarters of a mile in the west of the township and gradually narrows till it finally runs out altogether in section 20, beyond which the shore is steep and rocky.

As might be expected, the soil is almost everywhere rocky in the upper benches, being mainly of whitish clay, except in a few places where the humus has escaped the fires, which have destroyed most of the big timber. On the lower bench, however, the soil is mostly sand and gravel.

To render the higher lands, here considered, accessible for settlement, it is probable that a high-level road would have to be opened up. This could probably be done by extending the White lake trail eastward through township 23, range 9, to this township.

The soil is a shallow sandy loam, broken by rocky outcrops, except in the western portion where the slope is more moderate and the soil richer and deeper.

The climate and soil would probably render this district suitable for fruit growing. The timber is principally second growth. Water is to be had in springs, but surface water is scarce. In sec. 23 an outcrop of limestone occurs. Bears and deer constitute the game supply, and salmon are also found.

Tp. 24, R. 8, W. 6th Mer. *A. O. Wheeler, D.L.S., 1908.*

SEC. 13, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 12, FRAC. NE. $\frac{1}{4}$, FRAC. SE. $\frac{1}{4}$.—Broken and hilly high land, rising in steps from lake to 1,100 feet above, soil generally brown, sandy loam and stony, some tracts of very suitable land for cultivation, the flats and gentle slopes seem suited for fruit growing, generally old brûlé covered by second growth of alder, birch, willow and poplar, practically no timber of lumber value, excepting a strip of half a mile or less on slope adjoining lake front, here fir to 30 inches, white pine to 20 inches and cedar to 24 inches diameter are seen in bunches, two small streams traverse the area and north of it a strong flowing creek has cut a deep ravine; from this, water could possibly be carried; there are a number of small springs here and there throughout, the back portion is very much broken by rocky bluffs.

SEC. 28, PART OF SECTION 21.—High land rising in short benches and steps to limit of altitude, 1,200 feet, with a good sized tract of gentle slope, almost a flat, in the centre, soil, a deep sandy loam, stony on the steep slopes, a quantity of good agricultural land, timber: small fir and cedar scattered throughout, but does not exceed 15 inches in diameter, all in timber berth 335, steep acclivity, about 300 feet along lake shore.

PART W. $\frac{1}{2}$ SEC. 36; FRAC. SEC. 35; FRAC. SEC. 26; PART W. $\frac{1}{2}$ SEC. 25, PART SEC. 23; FRAC. SEC. 22.—High land rising in steps and narrow benches to 1,200 feet above Shuswap lake, soil, reddish brown sandy loam with a whitish clayey subsoil, stony throughout, rocky in parts, a considerable portion of the area can be used for agriculture, timber: in secs. 35 and 36 some good fir and cedar to 24 inches diameter, and scattered white pine, balance small, in secs. 25 and 26, a lot of good cedar to 3 feet diameter, fir to 4 feet diameter and some white pine to 30 inches, the balance of timber consists of small hemlock, pine, cedar fir and brush with some large cottonwood in the hollows, in secs. 22 and 23 a general scattering of cedar to 36 inches, fir to 24 inches (more plentiful near the shore) and a few white pine, all in timber berth 241, general easy slopes from lake shore.

SEC. 36, FRAC. SW. $\frac{1}{4}$; SEC. 35, FRAC. SE. $\frac{1}{4}$.—High land rising from lake to 300 feet, soil sandy loam, generally rocky and stony, very dry, poor agricultural land, birch, cedar and hemlock with undergrowth near shore, as hillside is ascended timber gets smaller, a sprinkling of fir to 24 inches diameter.

W. J. Deans, D.L.S., 1910.—Frac. sec. 22 of this township lies along the shore of Seymour arm, Shuswap lake. From the shore of the lake the land rises abruptly to a bench 300 feet high extending 6 or 7 chains inland, and from there a succession of very narrow benches rise higher and higher as we go inland. The soil throughout the township is sand or clay mixed with stones and rocks. Here the surface is covered with small hemlock, poplar, birch and fir trees, but little of the timber is suitable for lumber. Sec. 23 is a sloping mountainside the east half of which is covered with small hemlock and the west half consisting of some narrow benches of fair farming land. The mountainside extends into sec. 26 with narrow benches and the surface is timbered with small trees and brush. Cedar, fir and hemlock from 12 to 16 inches in diameter are found on the land, and from the centre of this section quite an area of farming land extends westward. A small stream of good water crosses the north boundary of the southwest quarter of the section a short distance west of the quarter-section corner. The western portion of the section slopes sharply to the lake and the kinds of timber previously mentioned are found on the land. Some of the cedars are 4 feet in diameter, but are shells and of no commercial value. The fir, too, that we cut was rotted at the heart. Sec. 25 is a mountainside showing a few scattered trees but unfitted for farming. There are some good patches of land in sec. 35, and while the timber along the lake shore is small, farther inland it is much

better. In the southwest quarter of sec. 36 is a small stream of good water flowing through a ravine 90 feet in depth. The ravine contains a flat of clay and black muck and is 3 chains wide. Timber berth 241 is partly in this section. The northwest quarter of sec. 13 is a steep mountainside, while the northeast quarter is nearly level, has a good clay soil and is covered with a light growth of spruce and birch. This land, together with the southeast quarter, which is a succession of slopes and benches, is well suited for farming. A small creek runs through the section. The northeast quarter of sec. 12 slopes toward Anstey arm and is cut up by ravines and ridges.

Tp. 25, R. 8, W. 6th Mer. *A. O. Wheeler, D.L.S., 1908.*

FRAC. SEC. 12; FRAC. SEC. 13; FRAC. SEC. 24.—Bench land 300 to 700 feet above Shuswap lake, from bench land in sec. 12, spur of mountain rises steeply, soil, a sandy loam or clayey loam, stony in parts, much good agricultural land, timber in secs. 12 and 13, chiefly good hemlock with good cedar to 3 feet diameter in swampy places and in the valleys, also white pine of lumber value, in sec. 24 timber small with second growth, a sprinkling of fir throughout, all in timber berth 241, in sec. 24 a narrow margin of flat adjoining Beach bay.

FRAC. SEC. 25; FRAC. SEC. 36.—High land broken by lateral ridges and rocky bluffs, rising to 800 feet above Shuswap lake, soil, brownish and reddish sandy loam with whitish clayey subsoil, very stony and in parts rocky, patches of agricultural land on the slopes and in the hollows, timber generally small, some good cedar and fir to 30 inches diameter, and some good hemlock in vicinity of stream in sec. 36.

SEC. 27; PART SE $\frac{1}{4}$ SEC. 28; E. $\frac{1}{2}$ SEC. 21; SEC. 22; E. $\frac{1}{2}$ SEC. 16; PART E. $\frac{1}{2}$ SEC. 9; FRAC. SEC. 10; NW. $\frac{1}{4}$ SEC. 3.—May be generally classified as high land rising in a series of steps and benches to the limit of altitude, 1,200 feet above Shuswap lake, there is a steep acclivity rising from the lake shore of about 300 to 500 feet which is worthless, soil, light clayey loam stony in parts, a lot of good class agricultural land on the slopes and benches, timber: in secs. 27, 28, 21, 22 and 16 a lot of good cedar, fir and hemlock throughout, hemlock and fir to 2 feet diameter, and in western half of sec. 22, cedar to 50 inches diameter, in secs. 9, 10 and 3 all timber has been burnt off clear leaving only blackened stumps. The entire area is within timber berth 301.

Tp. 26, R. 8, W. 6th Mer. *A. O. Wheeler, D.L.S., 1908.*

FRAC. SEC. 1.—High land rising to 600 feet above Shuswap lake, soil, sandy loam, stony, in parts rocky, poor agricultural land, timber, small fir, white pine, hemlock, cedar, birch and cottonwood, steep rise from lake shore.

FRAC. SEC. 12; FRAC. SEC. 1.—Bench land, northwestern part worthless, steep rock falls and rock bluffs, southwest part a general slope to the lake with benches, patches could be cultivated, soil, brown sandy loam, stony with rock outcrops, timber, second growth with scattered green fir, on fractional NW. $\frac{1}{4}$ sec. 1 some cedar and fir of lumber value, but best has been logged.

FRAC. SEC. 2.—Bottom land and high land, frac. NE. $\frac{1}{4}$ is chiefly flat at mouth of Celista creek, soil rich sandy loam, good agricultural land, some fir, cedar and pine but best has been logged, Kamloops Lumber Company have a camp here and the flat is covered by berth 315. The high land portion of the NE. $\frac{1}{4}$ and of the NW. $\frac{1}{4}$ possible for cultivation has been burnt over comparatively recently, soil, a reddish sandy loam, with stones and gravel, timber second growth of fir, birch, pine and poplar with alder, willow and cherry, a deep gorge with strong flowing mountain stream cuts through NW. $\frac{1}{4}$, on west side of it a steep rise covered by brulé and windfall, patches possible of cultivation, no timber of lumber value on this highland.

Tp. 17, R. 9, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 9, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 10, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 13, NE. $\frac{1}{4}$; SEC. 14, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 23, SE. $\frac{1}{4}$; SEC. 24, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 25, SE. $\frac{1}{4}$.

—Nearly all fractional $\frac{1}{4}$ sections adjoining land disposed of, steep mountain slopes partially open, scattered fir and bull pine, possible timber value, land is of value for grazing and much of it is held for that purpose under leases 3130, 3366, 3271, and 3364.

Tp. 18, R. 9, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 18, .LS. 5.—Rough rolling country 600 to 800 feet above the Shuswap valley, light clay, rather stony, scattered fir, bull pine to 18 inches diameter, willow, birch, etc., small timber value, value as fruit land about 15 per cent, very rocky on south side.

SEC. 19, E. $\frac{1}{2}$ OF NE. $\frac{1}{4}$.—A rocky ridge 600 to 900 feet above the Shuswap valley, scattered fir up to 1 foot diameter, fair timber value, considerable pine grass throughout, no value for cultivation.

SEC. 20, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 21, SW. $\frac{1}{4}$.—Rolling bench land 700 to 850 feet above the Shuswap valley, light clay with much gravel, stony in places with occasional rock outcrops, some scattered fir to 18 inches diameter in NW. $\frac{1}{4}$ sec. 20, possible timber value, remainder covered with willow brush, jack pine, small fir and cedar no timber value, 40 per cent fruit land, no water available for irrigation. There is a squatter, Joseph Dunwoodie on the SW. $\frac{1}{4}$, sec. 21.

SEC. 28, W. $\frac{1}{2}$ OF SE. $\frac{1}{4}$.—High rolling bench land and steep slopes 1,000 to 1,150 feet above the Shuswap valley, light clay, stony and rocky, scattered fir up to 2 feet diameter, possible timber value, land of no agricultural value, partly open and might be of some use for grazing.

SEC. 28, NW. $\frac{1}{4}$.—Rough bench land 900 to 1,275 feet above the Shuswap valley, red sandy clay with stone and gravel, small fir, jack pine, willow and birch, some scattered large fir, partially open with much pine grass, of some use for grazing, a tract about 20 chains wide through middle of $\frac{1}{4}$ section might be of use for farming if not too dry, no water for irrigation.

SEC. 29, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Rough bench land and steep rocky slopes 625 to 1,390 feet above the Shuswap river, sandy clay, stony and rocky in places, poplar, birch, willow and small fir, scattered fir up to 15 inches diameter, timber value in NW. $\frac{1}{4}$, partially open with much pine grass, might be of some value for grazing, no value for farming.

S.W. $\frac{1}{4}$.—Rolling bench land 700 to 1,000 feet above the Shuswap valley, light clay with a good deal of gravel, scattered fir up to 15 inches diameter, low timber value, value about 40 per cent fruit land if not too dry, no water for irrigation.

SEC. 30, SW. $\frac{1}{4}$, W. $\frac{1}{2}$ NW. $\frac{1}{4}$.—Rough rolling land rising toward west 525 to 850 feet above the Shuswap river, light clay, very stony and rocky, old brulé with poplar and willow brush, much windfall, scattered clumps of fir 12 inches diameter, of no use for cultivation, worthless in present condition.

E. $\frac{1}{2}$ OF NE. $\frac{1}{4}$.—Rough land 525 to 710 feet above the Shuswap river, light sandy clay, stony in places, much small cedar and fir with scattered fir and cedar to 12 inches diameter, small timber value, value as fruit about 40 per cent, no water for irrigation.

SEC. 32, NW. $\frac{1}{4}$.—Rolling bench land sloping to west 600 to 800 feet above the Shuswap river, light clay and clay loam, stony on ridges, alder, willow, jack pine and fir, scattered fir up to 1 foot diameter, no timber value, about 50 per cent for fruit, some of land suitable for farming also.

SEC. 32, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 33, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$, W. $\frac{1}{2}$ OF NE. $\frac{1}{4}$.—Land lies along the upper part of a rough rocky ridge 700 to 1,400 feet above the Shuswap river, light, stony clay with frequent rock outcrops, chiefly covered by small fir and jack pine, some willow and poplar in pockets and a few scattered large fir, no water, land is too rough for cultivation, there is much pine grass where open, and it might be of some value for grazing.

TP. 19, R. 9, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 4, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Rolling rocky benches and steep slopes, red clay loam, small fir, pine, poplar and willow brush with a few scattered large fir, very doubtful timber value, open in places with pine grass, especially on top of ridges, NW. $\frac{1}{4}$ of no value for cultivation, might be of some use for grazing, SW. $\frac{1}{4}$ and SE. $\frac{1}{4}$ might be of some use for fruit, but would be very poor, the best land would be on the west side of SW. $\frac{1}{4}$, land is very dry without water.

SEC. 5, SE. $\frac{1}{4}$.—Rolling bench land 600 to 765 feet above the Shuswap river, light clay and clay loam, very stony in places, small fir, poplar and willow, a few large fir, no timber value, fruit land 40 per cent. There is some swamp, but most of land is very dry and without means of irrigation.

E. $\frac{1}{2}$ OF SW. $\frac{1}{4}$, E. $\frac{1}{2}$ OF NW. $\frac{1}{4}$.—Rolling, rocky ridges about 600 to 750 feet above the Shuswap river, clay, rather swampy between ridges, small fir, jack pine, poplar and willow partially open and of some value for grazing, most of land is too rough to be of any use for cultivation, except a very dry stony bench at south end of SW. $\frac{1}{4}$.

SEC. 6, SW. $\frac{1}{4}$.—Somewhat rolling slopes rising to west 570 to 1,000 feet above the Shuswap river, red clay loam with much stone, old brulé overgrown with poplar, willow and small fir, no timber of value, some of slopes might be suitable for cultivation, fruit land about 30 per cent.

SEC. 6, NW. $\frac{1}{4}$; SEC. 7, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Steep mountain slopes 600 to 1,300 feet above the Shuswap valley, red clay loam, stony, scattered fir with much windfall and thick underbrush, no timber value, land is too steep for farming, but it is possible that some of the lower slopes would grow fruit.

SEC. 9, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$, FRAC. NW. $\frac{1}{4}$.—Steep slopes and rocky benches 500 to 1,200 feet above the Shuswap river, sandy clay, stony, small fir, willow and poplar with scattered large fir, doubtful timber value, partially open with pine grass, of some value for grazing, of very little agricultural value, E. $\frac{1}{2}$ of SW. $\frac{1}{4}$ and NW. $\frac{1}{4}$ broken by high rock cliffs.

SEC. 14, FRAC. NE. $\frac{1}{4}$.—About 23 acres of land remaining in $\frac{1}{4}$, formerly homesteaded but recently cancelled, land not examined.

SEC. 15, E. $\frac{1}{2}$ NW. $\frac{1}{4}$.—Rolling bench land about 400 feet above the Shuswap river, sandy loam, stony, old brulé with scattered fir up to 18 inches, no timber value. There is a small creek through centre, fruit land 50 per cent.

SEC. 18, E. $\frac{1}{2}$ OF SE. $\frac{1}{4}$; NE. $\frac{1}{4}$; SEC. 19, SE. $\frac{1}{4}$.—Steep mountain slopes 600 to 1,100 feet above the Shuswap valley, light clay loam, very stony and rocky in places, old brulé with much windfall and thick brush, SE. $\frac{1}{4}$, sec. 19, in timber berth 384, but there is little timber of any value. Some of the lower slopes in NE. $\frac{1}{4}$ of sec. 19 might be suitable for fruit.

SEC. 18 AND SE. $\frac{1}{4}$ OF SEC. 20, NW. $\frac{1}{4}$.—Rolling, rocky bench land 600 to 850 feet above the Shuswap river, soil sandy clay, very stony broken by rock ridges, old brulé overgrown with poplar, willow and small fir, no timber value, only small pockets of land suitable for cultivation, value about 15 per cent for fruit.

SEC. 26, NE. $\frac{1}{4}$; SEC. 27, NW. $\frac{1}{4}$.—Bench land 500 to 1,000 feet above the Shuswap river, soil, red sandy loam, stony in places, all old brulé, overgrown with poplar, willow and small fir, many of slopes gentle, fruit land 30 per cent in lower slopes very dry and with very little water, NE. $\frac{1}{4}$ sec. 26, slopes to the east and NW. $\frac{1}{4}$ sec. 27, slopes south and west. There is a squatter named Monk on NE. $\frac{1}{4}$ of 26.

SEC. 29, N. $\frac{1}{2}$ SE. $\frac{1}{4}$.—Rough bench land 515 to 800 feet above the Shuswap river, sandy clay, very stony with rock outcrops, scattered large fir with thick underbrush, poplar, willow, small fir and pine, possible timber value, only a little land in the east and some small pockets of any value for cultivation.

SW. $\frac{1}{4}$.—Rough bench land rising to steep rocky mountain slopes, clay to clay loam broken by rocky outcrops, old brulé on east side slopes to west, timbered, thick small fir, cedar and hemlock with scattered timber up to 1 foot diameter, possible

lumber value. There is a strip of swampy land 10 to 15 chains wide through the centre of $\frac{1}{4}$ section which would make good farm land, value about 70 per cent.

SEC. 29, NW. $\frac{1}{4}$; SEC. 31, NE. $\frac{1}{4}$; SEC. 32, SW. $\frac{1}{4}$.—Rough, rocky mountain slopes and ridges 550 feet and upwards above the Shuswap river, old brulé overgrown with poplar, willow and small fir, much windfall, no timber value, no agricultural value.

SEC. 34, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$, SEC. 35, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, SEC. 36, NW. $\frac{1}{4}$.—Rolling bench land 650 to 1,150 feet above the Shuswap river, red clay loam, stony in places, old brulé, overgrown with poplar, willow and small fir, scattered fir up to 18 inches in places, but of no timber value, some of lower slopes might be suitable for fruit, and much of the remainder could be used for farm land, if not too dry, value as farm land about 40 per cent, land is high and there is no water available for irrigation.

SEC. 36, SW. $\frac{1}{4}$.—Rather steep slopes facing east 200 to 800 feet above the Shuswap river, red clay loam, old brulé, poplar, willow and small fir with scattered large fir, no timber value, many of slopes would be suitable for fruit, value about 40 per cent, land is very dry and there is no water for irrigation.

Tp. 20, R. 9, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 1.—Rather rough, broken bench 700 to 1,200 feet above the Shuswap river, sandy loam, stony with rock outcrops on ridges, spruce, fir, cedar, hemlock and white pine to 24 inches diameter in north part of NE. $\frac{1}{4}$, remainder old brulé with thick underbrush and scattered large fir, no timber value, most of land is too rough for cultivation, but a few benches might be of use. The NW. $\frac{1}{4}$ would class about 25 per cent for farm land and it is doubtful if the remainder is any use for cultivation.

SEC. 2; SEC. 3.—Rolling bench land about 1,000 feet above the Shuswap river on the south and rising gradually to north, red sandy loam, stony in places with a few rock outcrops, old brulé with a few scattered large fir, no timber value, value as farm land 20 to 35 per cent, land is very dry and there is no water for irrigation.

SEC. 6, SE. $\frac{1}{4}$.—Mostly bench land about 600 feet above the Shuswap river, light clay loam with some gravel, fir, pine and poplar, mostly small and of doubtful timber value, SW. corner is broken by steep mountain slopes, about 100 acres would class 70 per cent for fruit if not too dry. Land has been homesteaded and abandoned.

SW. $\frac{1}{4}$.—Nearly all steep hillside 650 feet and upwards above the Shuswap river, clay loam, small fir, poplar, jack pine and willow, no timber value, very little of land any use for cultivation. There is a squatter named Frank Dovey on the $\frac{1}{4}$ section.

SEC. 4, E. $\frac{1}{2}$; SEC. 9, E. $\frac{1}{2}$ of SW. $\frac{1}{4}$.—Very rough, rocky slopes 800 to 1,400 feet above the Shuswap river, with some small benches, light sandy clay, stony, old brulé overgrown with small fir, poplar, birch and willow, no timber value, of very doubtful value for agriculture.

SEC. 12, SW. $\frac{1}{4}$.—Rolling bench land 1,000 to 1,250 feet above the Shuswap river, sandy loam, stony, chiefly old brulé, but with some fir, cedar and hemlock to 2 feet in places, possible timber value, value as farm land about 30 per cent.

SEC. 12, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 13, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Rolling bench land 1,050 to 1,300 feet above the Shuswap river, sandy clay loam, stony in places, fir, cedar, spruce and hemlock to 2 feet diameter, lumber value. The NE. $\frac{1}{4}$, sec. 12, contains a large area of open swamp and would class about 50 per cent as farm land, the remainder would class about 30 per cent.

SEC. 16, SE. $\frac{1}{4}$, NW. $\frac{1}{4}$; SEC. 21, SW. $\frac{1}{4}$; SEC. 20, NW. $\frac{1}{4}$; SEC. 29, E. $\frac{1}{2}$; SEC. 33, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Rather steep slopes adjoining land taken on the west, elevation 700 feet and upwards above the Shuswap valley, sandy clay loam, stony and rocky in places, old brulé overgrown with small fir, willow, poplar and jack pine, land is not suitable for farming and it is very doubtful if it is of any value for agriculture.

Tp. 21, R. 9, W. 6th Mer. *A. O. Wheeler, D.L.S., 1909.*

SEC. 7, FRAC. NE. $\frac{1}{4}$.—Largest part of $\frac{1}{4}$ section taken up by steep descent to lake. useless for cultivation, but has open patches with scattered fir and brush, which may be used for grazing purposes; along north boundary is narrow strip of bench land from 500 to 800 feet above lake, classed as fruitland of 50 to 60 per cent value. Soil, rich brown loam with stones and gravel. Timber, second growth fir, birch, and willow, with scattered larger fir to 24 inches diameter, a few cedar to 15 inches and spruce to 12 inches, of lumber value.

SEC. 18, E. $\frac{1}{2}$.—Heavily rolling and broken bench land with general ascent northwest, rising from 500 to 1,200 feet and over above lake, classed as fruitland of 25 to 50 per cent value to 800 feet and then as farm land of 20 to 50 per cent value to 1,200 feet; beyond is timber land. Soil, a dark sandy loam with stones and gravel, on steep slopes light sandy loam very stony and gravelly. Timber: small birch, cedar, fir, maple and willow second growth, with scattered larger fir to 24 inches diameter, occasional to 30 inches, cedar to 15 inches and occasional white pine to 18 inches, of lumber value.

SEC. 17, W. $\frac{1}{2}$, FRAC. W. $\frac{1}{2}$ OF E. $\frac{1}{2}$.—Bench land with general fall to SE., north part hilly and rolling, steep ascent from lake of 250 feet, then rising back to 950 feet above, classed as fruitland of 15 to 50 per cent value to 800 feet above lake, NW. corner of W. $\frac{1}{2}$ above this limit is classed as farmland of 20 per cent to 50 per cent value; soil, brown and reddish sandy loam, very stony and gravelly; timber: small fir, birch, cedar, jack pine, willow and undergrowth with scattered fir to 18 inches diameter, occasional to 24 inches, occasional white pine to 18 inches and cedar to 12 inches of lumber value, timber badly scorched near steep descent to lake, north part of this parcel of land is in timber berth 239, block 6.

SEC. 20; PART SEC. 21.—Very hilly and broken, generally steep hillsides sloping to creek flowing through centre of sec. 20 and to lake, SE. part classed as fruit land, rising from lake to 800 feet above, of 10 to 50 per cent value, above this limit are some lands that may be classed as farm lands, rising to 1,200 feet above lake, they are on steep slopes and would be very difficult of access; soil, brown and reddish sandy loam with stones and gravel, very stony in parts, chiefly on steeper slopes; timber: generally small fir, birch, jack pine, cedar and undergrowth, with scattered larger fir to 24 inches diameter, cedar to 15 inches and occasional white pine to 18 inches diameter, of lumber value, slopes to lake are fairly open with scattered bull pine to 15 inches diameter, W. $\frac{1}{2}$ of section is in timber berth 239, block 6.

Tp. 22, R. 9, W. 6th Mer. *A. O. Wheeler, D.L.S., 1908.*

SEC. 35; SEC. 34.—Whitish marl-clay subsoil, generally stony on high lands, on flats no stones apparent, steeper parts are most stony; there is a large percentage of good agricultural land on these sections; timber, the highlands in secs. 34 and 35 are either brûlé or else the timber is badly scorched, for the rest it is small fir, pine, hemlock, birch, cedar and a few white spruce not exceeding 15 inches diameter; there is none of lumber value. Near the lake most of the valuable timber has been logged. Large cottonwood, medium-sized poplar and red willows are seen in the hollows, all included in timber berth 455.

PART SEC. 32; PART SEC. 31.—Bench land from 100 to 200 feet above lake; parts of secs. 31 and 32, some good flats and benches of gently rolling land, gradually rising back to steep hillside, soil, brown, reddish or yellowish sandy loam with whitish marl-clay subsoil, where the rises are steep and on the ridges, soil is very stony with rock protruding in places, a fair percentage of good agricultural land, probably more or less gravel and shale will be found throughout but does not appear on the surface in the flats, timber, small, all second growth no big timber remains, fir, birch, poplar, spruce, cedar, hemlock, white pine, a few larch, alder and willow were seen, cottonwood and poplar grow in the lower parts or swales. There is practically no timber

of lumber value, as a rule the timber does not exceed 12 inches. Cedar is scattered throughout but all over 18 inches seem dead, only one stream was met with but the soil seems quite moist, all is included in timber berth 455, there seems little doubt that this bench land will shortly be squatted upon by the overflow of settlers from Celesta settlement, immediately across the lake to the northwest.

PART. SEC. 36; PART SEC. 35.—In these sections at an altitude of over 1,200 feet above the lake is an area of rolling land stretching south to high timbered slopes, soil, brown sandy loam free from stones, good agricultural land if not at too great an altitude; timber: hemlock to 30 inches, fir and cedar to 24 inches, occasional white pine to 18 inches, usual small growth and underbrush, for most part included in timber berth 239.

L. D. N. Stewart, D.L.S., 1910.—Boat connections may be made with points within a mile of this township from Blind Bay or Sicamous, but at present there are no roads. The soil is a sandy loam and is suitable for fruit growing or mixed farming. The surface has been mostly burned over and the northwestern part is mostly *brulé*, but fir and cedar from 6 to 30 inches in diameter are to be found. The only hay obtainable is in secs. 34 and 35, and it is of poor quality, but water is found in spring creeks, in a small lake in sec. 34 and in White lake, 4 miles long and 1 mile wide, situated in the southwest of the township. There are no water-powers, stone-quarries, nor minerals, but wood fuel is everywhere available. Game consisting of grouse, deer and ducks is plentiful, and trout abound in the streams. The climate is excellent, being similar to that of the Niagara peninsula, although there is less rain here in July, August and September, and a few summer frosts occur.

Tp. 23, R. 9, W. 6th Mer. *A. O. Wheeler, D.L.S., 1908.*

SEC. 1; FRAC. SEC. 2; FRAC. SEC. 12; FRAC. SEC. 13.—Highland rolling lumpily with a general steady ascent to southeast to over 1,200 feet above lake, soil reddish, brownish and whitish sandy loam, not very deep, over a whitish marl-clay, stony and gravelly throughout, no rock outcrops seen and few stones on surface, the stones being chiefly found on the steeper portions of the ascent, the whole area is more or less workable for agricultural purposes, several small streams flow through it though none large enough for irrigation purposes, except in a very minor way, the soil is fairly moist but might prove too dry when cleared. Timber: there is no great body of timber valuable for lumber, but a considerable quantity is scattered throughout; of this, fir is seen to 36 inches diameter, average 24 inches; white pine to 30 inches, average 24 inches; cedar is small but in low places and along the creeks goes to 30 inches, average 18 inches; hemlock prevails at a high altitude and is found to 30 inches diameter; in low spots cotton-wood is seen to 50 inches; for the rest, small birch, hemlock and cedar with hemlock brush is most prevalent. The east half of sec. 1, west half of sec. 2 and part of sec. 35 are old *brulé* encumbered with heavy windfall; here scattered dead and partly green cedar are seen to 36 inches. At 1,200 feet above the lake, the larger fir seem dead. For most part included in timber berth 239.

FRAC. Secs. 3, FRAC. Sec. 4.—Whitish marl-clay subsoil, generally stony on high lands, on flats no stones apparent, steeper parts are most stony, also stony near lake, there is a large percentage of good agricultural land on these sections; timber; small fir, pine, hemlock, birch, cedar and a few white spruce not exceeding 15 inches in diameter, except near and on the general slopes of the lake there is none of lumber value. Near the lake most of the valuable timber has been logged. Large cotton-wood, medium-sized poplar and red willows are seen in the hollows; all included in timber berth 455. A squatter named David Lamey has built a shack on the northwest quarter of sec. 4 and has a garden. There are two other squatters here, probably on southeast quarter and southwest quarter of sec. 4, but names are not known.

Sec. 5; FRAC. sec. 8; FRAC. sec. 6.—Bench land from 100 to 200 feet above lake, parts of secs. 5 and 6 high land rising from 200 to 900 feet above lake, then steep

side of high ridge to south; parts of sec. 5 and 6 some good flats and benches of gently rolling land gradually rising back to steep hillside; soil, brown, reddish or yellowish sandy loam with whitish marl-clay subsoil, where the rises are steep and on the ridges soil is very stony with rock protruding in places, a fair percentage of good agricultural land, probably more or less gravel and shale will be found throughout but does not appear on the surface in the flats, timber, small, all second growth, no big timber remains, fir, birch, poplar, spruce, cedar, hemlock, white pine, a few larch, alder and willow were seen, cottonwood and poplar grow in the lower parts or swales. There is practically no timber of lumber value, a few fir are seen near the lake shore to 24 inches diameter, as a rule the timber does not exceed 12 inches. Cedar is scattered throughout but all over 18 inches seem dead, only one stream was met with, but the soil seems quite moist, all is included in timber berth 455, there seems little doubt that this bench land will shortly be squatted upon by the overflow of settlers from Selestia settlement, immediately across the lake to the northwest.

FRAC. SEC. 17.—Chiefly bottom land, some bench land in north half rising back to 200 feet above the lake, soil, sandy loam, stony and gravelly in parts, good workable flat for agricultural purposes; timber: east of Ross creek a lot of brulé, no timber of lumber value, a few fir and cedar to 20 inches along creek, west of creek, scattered fir and cedar to 24 and 20 inches respectively, of no great lumber value; included in berth 240, Ross creek, a fine mountain torrent, flows through the northwest quarter.

FRAC. SEC. 18.—Bottom and bench land rising to 200 feet above lake, soil, sandy and clayey loam, stony in parts, good agricultural land; timber: small cedar, poplar, hemlock, cottonwood and mixed brush, sprinkling of fir to 24 inches, cedar to 24 inches and white pine to 16 inches, of no very great lumber value, included in timber berth 240.

SEC. 19.—A general gradual ascent from lake to steep mountain slopes at 1,100 feet above lake, soil, sandy and clayey loam, stony in parts, some good agricultural land; timber: small fir, cedar, birch, spruce, white pine and poplar, a sprinkling of fir 18 to 20 inches occasional 24 to 30 inches, cedar to 15 inches, spruce occasional to 18 inches, white pine occasional to 14 inches diameter, taken altogether the section is not of a very great lumber value, included in timber berth 240.

SEC. 20.—Bench land rising to steep mountain side at 1,100 feet in west half, and in east half to 600 feet above the lake; soil, sandy loam, stony in parts, some good agricultural land; timber: small fir, cedar, birch, white pine, spruce and hemlock, scattered fir to 24 inches and cedar to 20 inches throughout, of profitable lumber value, included in timber berth 240, Ross creek, a fine mountain torrent cuts through the west half.

SEC. 21, S. $\frac{1}{2}$; SEC. 16, FRAC. N. $\frac{1}{2}$.—With the exception of a small bit of flat along the lake shore in northwest $\frac{1}{4}$ of sec. 16, the land may be described as a general easy rise from the lake to high mountain slopes, soil, sandy loam, stony and rocky, in parts, some of the land fit for cultivation; timber, part old brulé and part newer burned, scattered fir to 24 inches diameter of not very appreciable value, included in timber berth 240.

PART SEC. 22; FRAC. SEC. 15; FRAC. SEC. 23; FRAC. SEC. 14; FRAC. SEC. 24; FRAC. SEC. 19.—May be described as an irregular general rise from lake to steep mountain sides, soil, sandy loam, stony throughout, bits that might be cultivated here and there, where rise not too steep, generally not suited for agricultural purposes, timber, small fir, birch, cedar, a few fir scattered throughout, average 18 inches, occasional trees to 24 inches, a few odd cedar to 15 inches diameter, not of a great lumber value, included in timber berth 240.

SEC. 29.—Only a small portion of the section may possibly be useful for cultivation, it is broken by the deep canyon of Ross creek, it rises from 800 to 1,200 feet and up above Shuswap lake, soil, sandy loam, stony in parts, some good agricultural land if not at too high altitude, timber, small fir, birch, cedar, jack pine, white pine and

hemlock with alder and usual undergrowth, a few fir and cedar were seen to 20 inches diameter, of little lumber value, included in timber berth 240.

L. D. N. Stewart, D.L.S., 1910.—There are no roads connecting with this township, but as it lies on the north and south sides of Shuswap lake, excellent connections can be had by water. The soil is a sandy loam, with a clay subsoil containing more or less iron and lime, and is suitable for mixed farming and fruit growing. Fir, cedar, birch, poplar, spruce and hemlock are found, the best fir and cedar adjoining Ross lake, but most of the timber has been burned and a thick second growth has sprung up. There is no hay, but there is plenty of feed on the hillsides. Water is generally sufficient, although all the streams except Ross creek dry up in summer. There are falls 100 feet high on Ross creek, about 1 mile from Shuswap lake, where power could be developed but the expense would be considerable. The climate is very fine, although there are a few summer frosts. Wood fuel is abundant, and game consisting of grouse and deer is plentiful. All kinds of trout are also found. There are no stone-quarries nor minerals.

Tp. 17, R. 10, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 10, FRAC. NE. $\frac{1}{4}$, NOT IN C. G. 780 AND 1764; SEC. 11, NW. $\frac{1}{4}$, FRAC. NE. $\frac{1}{4}$, NOT IN C. G. 1532 AND 4283; SEC. 14, SW. $\frac{1}{4}$; SEC. 15, FRAC. SE. $\frac{1}{4}$, NOT IN C. G. 780.—Rolling bench land with main slopes to east 900 to 1,300 feet above Shuswap lake, clay loam with considerable stone and gravel, timber, mostly small fir, jack pine and poplar some scattered large fir and bull pine, no timber value unless in SE. $\frac{1}{4}$, sec. 15, and north part SW. $\frac{1}{4}$, sec. 14, farm land 40 per cent if not too dry. There is no running water on the hill, and irrigation would be impossible.

SEC. 13, FRAC. NE. $\frac{1}{4}$, FRAC. SE. $\frac{1}{4}$ AND SW. $\frac{1}{4}$, NOT IN C. G. 2535, 186, 1532, NW. $\frac{1}{4}$; SEC. 14, FRAC. SE. $\frac{1}{4}$, NOT C. G. 1532, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$; SEC. 15, FRAC. NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, NOT IN C. G. 780, 685; SEC. 21, FRAC. NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, NOT IN C. G. 1570, 685; SEC. 22, FRAC. SW. $\frac{1}{4}$, NOT IN C. G. 685, SE. $\frac{1}{4}$.—Rough hilly land rising where highest to about 1,600 feet above Shuswap lake, clay loam with much stone and many rock outcrops, considerable underbrush with scattered large fir and bull pine up to 2 feet diameter, probable lumber value, much pine grass with some bunch grass, land of no value for cultivation, but of some use for grazing. There is no water on hill.

SEC. 21, FRAC. NW. $\frac{1}{4}$; SEC. 22, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 23; SEC. 24, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$, S. $\frac{1}{2}$ NW. $\frac{1}{4}$ AND NE. $\frac{1}{4}$.—Rough rocky ridges along the top of the main ridge rising to 1,865 feet above Shuswap lake, much small fir and jack pine with scattered fir and bull pine up to 24 inches, probable timber value, too rough for cultivation and too brushy for grazing.

SEC. 26, SW. $\frac{1}{4}$, S. $\frac{1}{2}$ OF NW. $\frac{1}{4}$; SEC. 27, SW. $\frac{1}{4}$ SE. $\frac{1}{4}$, S. $\frac{1}{2}$ OF NE. $\frac{1}{4}$, FRAC. NW. $\frac{1}{4}$ SEC. 28, SE. $\frac{1}{4}$, FRAC. SW. $\frac{1}{4}$.—All steep slopes facing north 500 to 1,700 feet above Shuswap lake, clay loam, stony in many places, much willow, poplar, small fir and jack pine, scattered large fir and bull pine, probable lumber value in sec. 28, nearly all slopes are too steep for cultivation and too brushy for grazing. There would be no water available for irrigation on these slopes.

Tp. 18, R. 10, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 6, SE. $\frac{1}{4}$.—Rough bench land 450 to 525 feet above Shuswap lake, sandy clay, stony on west side, fir and bull pine to 20 inches diameter, lumber value, in timber berth 441 (4), very dry, and too rough for farming, might possibly be of use for fruit, grazing land.

NE. $\frac{1}{4}$.—Rolling bench land 125 to 525 feet above Shuswap lake, sandy clay, fir and bull pine to 20 inches diameter, lumber value, in timber berth 441 (4), if not too dry, it might be of use for either fruit or farming, value as fruit land 50 per cent.

SEC. 6, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$; SEC. 7, SW. $\frac{1}{4}$.—Steep rocky hillside 450 feet and upwards above Shuswap lake, fir and bull pine up to 20 inches diameter, lumber value, in timber

berth 441 (4), might be of some value as grazing land, a narrow strip of land along the east side of SW. $\frac{1}{4}$, sec. 7, might be suitable for fruit.

SEC. 7, NW. $\frac{1}{4}$.—Rolling bench land 245 to 645 feet above Shuswap lake, broken on the west side by rocky cliffs, soil, sandy clay, fir and bull pine to 18 inches diameter, timber value, value as fruit land 50 per cent for east $\frac{1}{2}$. There is a squatter named J. G. Willet on $\frac{1}{4}$ section.

SEC. 8, FRAC. NE. $\frac{1}{4}$.—Mostly steep hillside 425 to 1,100 feet above Shuswap lake, white sandy clay, scattered fir and bull pine up to 2 feet diameter, lumber value, in timber berth 441 (2), grazing land, a small bench 425 to 500 feet high on the west side might be of use for fruit if not too dry.

SEC. 10, FRAC. SW. $\frac{1}{4}$, FRAC. SE. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 11, NW. $\frac{1}{4}$, FRAC. NE. $\frac{1}{4}$; SEC. 12, FRAC. NW. $\frac{1}{4}$, FRAC. NE. $\frac{1}{4}$; SEC. 13, S. $\frac{1}{2}$, SW. $\frac{1}{4}$; SEC. 14, S. $\frac{1}{2}$ SE. $\frac{1}{4}$, S. $\frac{1}{2}$ SW. $\frac{1}{4}$.—Steep hillside 500 to 2,200 feet above the Shuswap lake, black clay loam, some stone and some rock outcrops, open with scattered fir and bull pine, small timber value, much bunch grass, good grazing land, nearly all too steep for cultivation, some of the lower slopes in sec. 12, SE. corner of part described, might be of value for farming or fruit growing. There is a squatter named Baird on them.

SEC. 16, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 17, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 20, E. $\frac{1}{2}$ SW. $\frac{1}{4}$; NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 21, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Steep hillside facing west 200 to 2,100 feet above Shuswap lake, white sandy clay, stony in places frequent rock outcrops and shale slopes, scattered fir and bull pine to 2 feet diameter, lumber value, in timber berth 441 (2), much bunch grass, good grazing, especially in the E. $\frac{1}{2}$ of secs. 17 and 20. There is also in these a narrow bench 5 to 10 chains wide along the west side, elevation 250 to 500 feet, which might be of value for fruit if not too dry, E. $\frac{1}{2}$ of SW. $\frac{1}{4}$, sec. 20, might be of some value also. Land is very dry and there does not appear to be any means of irrigation.

SEC. 18, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$; SEC. 19, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, W. $\frac{1}{2}$, SE. $\frac{1}{4}$.—Bench land 130 to 700 feet above Shuswap lake, the west half of each section is gradual slope to east, the $\frac{1}{4}$ sections in the east side are rolling and broken, particularly near the Salmon river, soil sandy clay loam with some gravel, stony in a few places, scattered fir and bull pine to 24 inches diameter with considerable small fir and jack pine, low timber value, suitable for farming or fruit growing, value of SW. $\frac{1}{4}$ and NW. $\frac{1}{4}$, sec. 18, and NW. $\frac{1}{4}$ and SW. $\frac{1}{4}$, sec. 19, as fruit land about 75 per cent, value of remainder sec. 19 about 60 per cent and SE. $\frac{1}{4}$, sec. 18, about 40 per cent; while the land is dry there is considerable water flowing from the mountains and a good deal of it could be irrigated.

SEC. 28, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 29, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 32, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 33, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Steep hillside from 200 to 2,000 feet above Shuswap lake, white sandy clay, frequent rock outcrops and shale slopes, especially on the higher slopes scattered fir and bull pine to 24 inches diameter, lumber value, in timber berth 441 (2), land too rough and too dry for cultivation, good grazing land in E. $\frac{1}{2}$, sec. 29, and E. $\frac{1}{2}$, sec. 32, slopes farther east in secs. 28 and 33 become higher and have more underbrush but would be of some value for grazing.

SEC. 30, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land facing east 130 to 930 feet above Shuswap lake, nearly all of it between 350 and 850 feet, sandy clay loam without much stone, fir and bull pine to 24 inches diameter, lumber value, value as fruit land about 60 per cent. It is probable that water could be obtained to irrigate most of this if needed.

SEC. 30, NW. $\frac{1}{4}$; SEC. 31, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$, W. $\frac{1}{2}$ SE. $\frac{1}{4}$.—Nearly all steep hillside facing east 300 to 1,200 feet above the Shuswap lake, sandy clay, stony with occasional rock outcrops, fir and bull pine to 18 inches diameter, fair timber value, very little of land of any value except for grazing. On the west side of NW. $\frac{1}{4}$, sec. 30, and SW. $\frac{1}{4}$, sec. 31, there are a few acres of land 1,000 to 1,200 feet elevation which might possibly be of use for farming. Some of the lower slopes in SE. corner NW. $\frac{1}{4}$, sec. 30, and NE. corner NW. $\frac{1}{4}$, sec. 31, might be suitable for fruit.

SEC. 32, E. $\frac{1}{2}$ SW. $\frac{1}{4}$.—Low bench land 90 to 350 feet above Shuswap lake, clay loam, very stony, thick small fir and pine with very little timber of value, slopes to

west and would be suitable for fruit, value about 50 per cent, NE. corner is broken by steep hillside.

Tp. 19, R. 10, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 6, SW. $\frac{1}{4}$.—Rough, hilly land 550 to 1,250 feet above Shuswap lake, soil, sandy clay with much stone and gravel, much underbrush with fir and jack pine to 6 inches diameter, no timber value, a few acres in SW. corner about 1,200 feet elevation, might be of use for farming, otherwise worthless.

SEC. 6, NW. $\frac{1}{4}$; SEC. 7, SW. $\frac{1}{4}$.—Bench land 320 to 850 feet above Shuswap lake, sandy clay, very stony, thick small jack pine and small fir, no timber value, the slopes on east side are very gentle but the land is too stony to be of any value, there are good streams through both $\frac{1}{4}$ sections.

SEC. 7, NW. $\frac{1}{4}$.—Rolling bench lands 215 to 750 feet above Shuswap lake, sandy clay loam, not much stone, small jack pine and fir, scattered fir 6 to 10 inches diameter, possible timber value, land is rather rough, but might be of value for fruit, probable value about 30 per cent.

SEC. 4; SEC. 9; SEC. 16; SEC. 17, E. $\frac{1}{2}$; SEC. 20; SEC. 21; SEC. 28; SEC. 29; SEC. 32, SE. $\frac{1}{4}$.—Rolling bench lands and steep mountain sides 500 to 3,000 feet above Shuswap lake, sandy clay, stony in places and with many rock outcrops, scattered fir and bull pine to 24 inches diameter, lumber value, sec. 4 is included in timber berth 480, and secs. 9, 16, 21 and 28 in timber berth 441 (1). With the exception of small pockets, land is too rough to be of value for cultivation, there is much pine grass and bunch grass, all land is of some value for grazing, the best land being in W. $\frac{1}{2}$, secs. 4 and 9, E. $\frac{1}{2}$, sec. 17, and secs. 20, 21 and 28. The NE. $\frac{1}{4}$, sec. 17, sec. 20, sec. 29 and SE. $\frac{1}{4}$, sec. 32, are included in grazing lease 2768.

SEC. 33, S. $\frac{1}{2}$ OF NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—All steep hillside 300 feet and upwards above Shuswap lake, clay loam with much stone, old brush, overgrown with thick small poplar, willow and jack pine, no timber, of no value for cultivation and too rough for cultivation and too brushy for grazing.

Tp. 20, R. 10, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 1; SEC. 2, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 3, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Nearly all steep hillside 600 to about 2,000 feet above Shuswap lake, sandy clay with much stone and occasional rock outcrops, thick small fir, jack pine, poplar and willow brush, no timber value, too rough for cultivation and too brushy for grazing.

SEC. 6, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Steep rocky hillside, considerable fir up to 18 inches diameter, probable lumber value, much of land open with pine grass and some bench grass, of some value as grazing land. An entry for SW. $\frac{1}{4}$ was recently cancelled and there may be a little good farm land in the SE. corner. The NW. $\frac{1}{4}$ is included in grazing lease 3179.

SEC. 7, E. $\frac{1}{2}$; SEC. 18, E. $\frac{1}{2}$; SEC. 19, E. $\frac{1}{2}$; SEC. 30, E. $\frac{1}{2}$; SEC. 29, NW. $\frac{1}{4}$.—All steep hillside 500 feet and upwards above Shuswap lake, timber mostly small fir, jack pine and willow of very doubtful timber value, much underbrush but pine grass where open, land might be of some value for grazing, but very poor. The E. $\frac{1}{2}$ of sec. 7 is included in grazing lease 3192.

SEC. 29, SW. $\frac{1}{4}$.—Bench land and hillside 425 to 1,050 feet above Shuswap lake, bench land and easy slopes along east side, sandy clay loam with much stone and gravel, jack pine, small fir and cedar with some trees 1 foot diameter, no timber value, some of land has recently been burned over, value as fruit land about 25 per cent, there is a good stream in $\frac{1}{4}$ section.

SEC. 32, SE. $\frac{1}{4}$.—Rolling bench land and rocky hillside, bench land about 300 to 500 feet above Shuswap lake, white sandy clay with much stone and rock, small fir, cedar, poplar and willow, scattered large fir, no timber value, poor land for agricultural purposes and poor grazing land.

NE. $\frac{1}{4}$.—Steep hillside 500 feet and upwards above Shuswap lake, very rocky, small fir and cedar with scattered willow brush and poplar on rocks, of no value.

TP. 21, R. 10, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 5, E. $\frac{1}{2}$; SEC. 8, W. $\frac{1}{2}$, FRAC. SE. $\frac{1}{4}$; SEC. 17, SW. $\frac{1}{4}$; SEC. 18, S. $\frac{1}{2}$.—Steep rocky mountain slopes 500 feet and upwards above Shuswap lake, sandy clay with much stone and rock, small cedar, fir, pine, poplar and willow brush, a few scattered fir 12 to 18 inches diameter, no timber value, land of no agricultural or grazing value.

R. D. McCaw, D.L.S., 1909.—SEC. 10, NE. $\frac{1}{4}$ FRAC., SE. $\frac{1}{4}$ FRAC.—Land rises from Shuswap lake to about 400 feet, slopes rather steep in places, with rocky outcrops, very stony, scattered fir and bull pine to 18 inches, fair lumber value, some open places affording fair grazing, no agricultural value. In timber berth 407 and 134.

SEC. 11, NW. $\frac{1}{4}$.—Bench land, from 100 to 350 feet above Shuswap lake, gradual slopes, soil, sandy loam, very stony in places, scattered fir to 10 inches of little lumber value, small fir, birch, poplar and willow. Value as fruit land 75 per cent. In timber berth 407.

SW. $\frac{1}{4}$ FRAC.—Bench land, rising from Shuswap lake to 100 feet gradual slopes with rocky outcrops in places, soil, sandy loam, very stony, scattered fir to 10 inches, fair lumber value, small poplar, willow and birch, open places with fair grazing, value as fruit land 60 per cent. In timber berth 407 and 134.

NE. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Steep rocky slopes of mountain, scattered Douglas fir to 18 inches diameter, of lumber value, no agricultural value.

SEC. 14, NW. $\frac{1}{4}$.—A strip of bench land on the west of $\frac{1}{4}$, about 5 chains wide on the north and about 40 chains on the south, 220 to 500 feet above Shuswap lake, soil, sandy loam, rather stony, scattered Douglas fir to 18 inches, thick poplar, birch and willow, probable lumber value, fruit land 60 per cent; remainder of $\frac{1}{4}$ steep rocky slopes of mountain, scattered fir to 18 inches, of lumber value, small fir, birch, poplar and willow, very stony and rocky of no agricultural value. NW. $\frac{1}{2}$ in timber berth 407.

SEC. 14, SW. $\frac{1}{4}$.—Bench land, from 220 feet upwards. L. S. 6 and east part of L. S. 3, steep mountain slopes, very rough and rocky, scattered fir to 18 inches of lumber value, no agricultural value; remainder of $\frac{1}{4}$ gradual slopes. Soil, sandy loam, stony in places, thinly scattered fir to 18 inches, no lumber value, thick small fir, poplar, birch and willow. Small spring creek in west part, value as fruit land 65 per cent. In timber berth 407.

SEC. 15, NW. $\frac{1}{4}$ FRAC.—A strip of bench land along north boundary 10 chains wide, gradual slopes, soil, sandy loam rather stony, scattered Douglas fir to 18 inches, small poplar and fir scrub, value as fruit land 60 per cent.

NE. $\frac{1}{4}$ FRAC.—Bench land, gradual slope from 200 to 500 feet above Shuswap lake, soil, sandy loam, stony in places, scattered Douglas fir to 18 inches, probable lumber value, with thick growth of birch to 8 inches, value as fruit land 70 per cent. The NW. 10 acres not in timber berth; strip 10 chains wide on east side of $\frac{1}{4}$ in timber berth 407; remainder in timber berth 239 (8).

SE. $\frac{1}{4}$ FRAC.—Bench land, from 200 to 600 feet above Shuswap lake; L. S. 6 and N.E. part of L. S. 5 gradual slopes soil sandy loam and clay loam in places, stony, scattered fir to 18 inches, fair lumber value, thick poplar, birch and willow scrub. Fruit land 70 per cent, remainder of $\frac{1}{4}$ broken by steep and rocky slopes of small hill, very broken, Douglas fir and scattered spruce of lumber value, thick willow, poplar and birch, open places with fair grazing, no agricultural value. In timber berth 407.

M. P. Bridgland, D.L.S., 1909.—SEC. 19, SE. $\frac{1}{4}$.—Rolling bench land 300 to 425 feet above Shuswap lake, sandy clay without much stone, willow brush and young fir with much windfall, good timber taken off, good farm or fruit land, value as fruit land about 60 per cent, Tappen creek flows through south side.

R. D. McCaw, D.L.S., 1909.—SEC. 22, NW. $\frac{1}{4}$.—Bench land, broken west side, gradual slopes, 250 to 675 feet above Shuswap lake (Salmon arm), soil sandy loam, clay loam in places, stony, scattered Douglas fir to 18 inches, of lumber value, fir and cedar scrub. Value as fruit land, 60 per cent. In timber berth 239 (8).

NE. $\frac{1}{4}$.—Bench land, about 450 feet rising to steep slopes of mountain on east. About 40 acres in NE. of quarter too rough and steep for cultivation, Douglas fir to 18 inches, of lumber value. Remainder of quarter, gentle slopes, soil sandy loam, rather stony, scattered Douglas fir to 18 inches, lumber value. Fruit land 60 per cent. In timber berth 239 (8).

SW. $\frac{1}{4}$.—Bench land, gradual slopes, 150 to 675 feet above Shuswap lake, broken on west side, soil, sandy loam, rather stony, scattered Douglas fir to 18 inches, of lumber value, small fir and poplar scrub, fair grazing. Value as fruit land 60 per cent. In timber berth 239 (8).

SE. $\frac{1}{4}$.—Bench land, rolling, about 450 feet above Shuswap lake, rising to steep slopes of mountain on east, soil, sandy loam, stony in places. Scattered Douglas fir to 18 inches, with poplar, willow and birch scrub, value as fruit land 60 per cent. In timber berth 239 (8).

M. P. Bridgland, D.L.S., 1909.—SEC. 29, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Rough, rolling, hilly land 350 feet and upwards above Shuswap lake, sandy clay stony in many places with occasional rock outcrops, scattered large fir, no timber value, poor farm or fruit land, about 40 acres of NW. $\frac{1}{4}$ and about 20 acres NE. $\frac{1}{4}$ might be suitable for fruit, and the rest would make poor grazing land, NE. $\frac{1}{4}$ is very rocky. A squatter named Thos. Fowler is on the NW. $\frac{1}{4}$.

SEC. 30, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 31, SE. $\frac{1}{4}$; SEC. 32, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough, hilly land 450 feet and upwards above Shuswap lake, sandy clay with much rock and stone, partially open, much small fir, poplar and willow brush, some large fir in sec. 30 which is under timber berths 250 and 242, of very doubtful timber value, land unsuitable for cultivation, but of some value as grazing land.

SEC. 32, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Rolling bench land 300 feet above Shuswap lake on north side of C.P.R., and steep hillside, small fir, poplar and willow, no timber value, good farm or fruit land north of railroad. There is a squatter, Angus McLeod, on NW. $\frac{1}{4}$, and Thos. Sanderman is on the NE. $\frac{1}{4}$, sandy clay loam, stony on hillside, which is in south.

Tp. 22, R. 10, W. 6th Mer.—*W. J. Deans, D.L.S., 1910.*

The northern half of sec. 6 in this township is gently rolling while the southern half is broken by ravines from 20 to 80 feet in depth. The soil throughout this section is clay, and soil of the same nature is found throughout the whole township with the exception of a few parts where it is mixed with sand or gravel. The timber has been cut from the land, which is now covered with small trees of cedar, poplar and fir. A small creek of good water flows through the section in a southeasterly direction, and along the northern boundary, a road extends to Notch Hill. Sec. 5, with the exception of the southeastern portion which is broken by a ravine 125 feet in depth, through which flows a small stream of good water, is rolling country. The timber has been removed, but in places there are still some fir and cedar, standing. The road to Notch Hill runs along the northern boundary. In the centre of the section lies a small lake, about 18 acres in extent. A creek from White lake runs through sec. 4 in a southeasterly direction, and along its shores lies a large flat. The timber has been cut, and quite recently a fire has run over most of the section. In the north-eastern quarter is an old mill site, and the road to Notch Hill runs diagonally through the section. The western half of sec. 3 is a rolling bench, the eastern half being covered by Bastion mountain. The soil of the mountain side is composed of sandy loam and stone, the surface having been recently burned over, and no underbrush is found. Near the foot of the mountain are many fine springs of pure water. The trail to Notch Hill runs along the southern boundary of sec. 7, which is, in its northern half and westerly 30 chains, a rough mountainside that runs down into the southwest quarter twenty chains. The soil of this part is sand, clay and gravel with stones, and a lake about 20 acres in extent takes up a portion of it. There is a difference in elevation of some 550 feet between the northern and southern halves of the section.

The surface and soil of sec. 8 are similar to those of sec. 7, but the whole surface of this section is covered with a thick growth of small poplar, cedar and fir. A small lake of excellent water, surrounded by high hills, lies in the northwest quarter. The trail to Notch Hill runs along the southern boundary and the section is cut by a logging trail running north and south through its centre. A surface rough and hilly and a soil that is sand, or a mixture of sand, clay and stones are features of sec. 9, pure clay soil being found only in the eastern part of the southeast quarter. The creek from White lake, a small stream from which some water-power might be developed at small cost, enters sec. 9 on its northern boundary near the east side, flows southerly, enters sec. 10, and then flowing southwesterly re-enters sec. 9, which it leaves about the middle of the northern boundary of the northeast quarter of sec. 4. The southeast corner of sec. 10 is covered by Bastion mountain. A ravine, in depth from 120 to 140 feet, cuts through the westerly part of the section, and marks the course of the creek from White lake. There are still some pine and fir at the northwest corner of this section. With the exception of a small rolling bench of clay land at the northwest corner, sec. 10 is taken up with Bastion mountain. There are many springs of good water, but fire has damaged what little timber is on the section. Sec. 18, on the west half of which there is still some good pine and fir timber slopes towards Shuswap lake which occupies a portion of the northeast quarter of the section. The eastern part of the section is broken by ravines from 30 to 80 feet in depth. The soil in the southern half is clay, with sand and clay in the remaining parts. Along the shore of Shuswap lake a road runs to Notch Hill. The eastern part of sec. 17 is formed by the side of a steep mountain which rises some 1,200 feet above the level of Shuswap lake. The westerly part is rolling, with clay soil and in the northwest quarter of the section, between the mountain and the lake is a narrow flat. The timber has been cut from this, but there are considerable spruce and fir trees, on the mountainside. A trail extends through the western half of the section to the shore of Shuswap lake. Sec. 16 is mountainous and, with the exception of a small flat in the southeastern part, the soil is sand and clay and very stony. Scattered throughout the section is a large amount of spruce, fir, cedar and pine timber. The southeast quarter of this section borders on White lake, and the creek from it runs through the same quarter section. Sec. 13 is taken up in its southern part mostly by Bastion mountain and in its northern part by White lake. Several small creeks run down the mountainside. On the shore of the lake in the northwest quarter is a small flat of sandy soil. Plenty of fir, spruce, cedar and pine timber is found along the lake shore.

A. O. Wheeler, D.L.S., 1908. SEC. 4, N. $\frac{1}{2}$ AND SE. $\frac{1}{4}$.—Patented.

SEC. 4, SW. $\frac{1}{4}$; SEC. 5.—Rolling bench land, 300 to 400 feet above Shuswap lake, soil, deep sandy or clayey loam, good agricultural land, timber, small birch, poplar, cedar, fir and pine of no lumber value, largely burned over, appears to have been logged, included in berth 239.

SEC. 7.—Heavily rolling bench land from 200 to 900 feet above Shuswap lake, soil sandy loam, stony in parts, good agricultural land, timber, section largely burned over, a few scattered fir to 2 feet, has already been logged, remaining timber small, chiefly second growth, some white pine to 18 inches, included in timber berth 239.

SEC. 8.—Heavily rolling bench land, 250 to 600 feet above Shuswap lake, soil, deep sandy and clayey loam, stony on steeper slopes, good agricultural land, timber, small poplar, fir, birch, pine and hemlock, largely burned over, has been logged, no lumber value, included in timber berth 239.

SEC. 9.—High land ridges from 300 to 800 feet above Shuswap lake, soil, good sandy loam, suitable for agriculture where not too steep, timber, green fir and cedar, on ridges, of lumber value, fire of last summer has overrun east half of section and scorched timber pretty badly, most of the good timber has been logged on west half. Included in timber berth 239.

SEC. 10; PART SEC. 11.; SEC. 3.—Bench land broken by ravines and ridges, soil, reddish brown sandy loam with small stones and gravel, good agricultural land, timber nearly all destroyed by fire of last summer, in sec. 11 and southeast $\frac{1}{4}$ of sec. 10

bench lands merge into steep stony slopes of Bastion mountains, these slopes badly overrun by the fire and large areas of valuable timber destroyed, included in timber berths 129 and 239.

FRAC. SEC. 14.—Rolling bench land rising to steep slopes of Bastion mountain, narrow flat around White lake, flat 400 feet above Shuswap lake, bench land from 400 to 600 feet, soil brownish and reddish sandy loam with stones and gravel, white marl-clay subsoil, largest portion burned over this summer; timber, most of it killed by fire, some good fir and cedar to 36 inches around lake in belt of green timber, some good agricultural land, included in timber berth 239.

FRAC. SEC. 15, SOUTH OF WHITE LAKE.—Unevenly rolling bench land, 400 to 475 feet above Shuswap lake, narrow flat around White lake 400 feet; soil red and brown sandy loam with stones and gravel, some good agricultural land, large portion burned over, fir and cedar of lumber value near lake, included in timber berth 239.

FRAC. SEC. 15, NORTH OF WHITE LAKE.—Narrow flat around White lake, balance high land rising to 700 feet above Shuswap lake, good agricultural land on flat, brown loam free from stones, fir and cedar of lumber value on flat around lake, included in timber berth 239.

SEC. 16.—Excepting flat around White lake, 400 feet above Shuswap lake, all broken high land rising to 700 feet, soil, brown sandy loam, stony and rocky in parts, patches of agricultural land here and there, scattered fir and cedar of lumber value throughout, south half in timber berth 239, north half in timber berth 455.

SEC. 17.—Bottom land around Shuswap lake, bench land rising to 275 feet above lake, highland rising to 1,200 feet and over, bench land and flat good agricultural land, high land in patches, a lot of good fir on high lands, small scrubby fir scattered over bench land and flat, the best has been logged, included in timber berth 239.

FRAC. SEC. 19.—Entry granted.

SEC. 18, FRAC. N. $\frac{1}{2}$.—Entry granted.

S. $\frac{1}{2}$.—Uneven bench land to 700 feet above Shuswap lake, soil, sandy loam, stony in parts, some good agricultural land, southeast $\frac{1}{4}$ largely burned over, little timber of lumber value, scattered fir, and cedar of lumber value on southwest $\frac{1}{4}$, included in timber berths 455 and 239.

A. O. Wheeler, D.L.S., 1909.—PARTS OF SECTIONS 19 AND 20 ADJOINING SHUSWAP LAKE.—Narrow, flat 1 to 3 chains wide around lake, then land rises back 500 feet or more in slopes of varying steepness, that may be cultivated in parts for a distance not exceeding half a mile. Soil, reddish sandy loam, suitable for fruit growing, of 50 per cent value, stony and rocky in places. A quantity of fir timber is scattered in patches throughout, generally small and crooked, and not very valuable for lumber, though would probably be valuable for tie timber. All in timber berth 455. Beyond half-mile zone is similar timber to rock steeps, probably 20 chains farther. A squatter, John Immel, has built a house on SW. $\frac{1}{4}$, sec. 20, and has some land under cultivation. He lives there with his wife and family.

FRAC. SEC. 30.—Flat along lake shore from 6 chains wide to 30 chains wide on point; then land rises back in fairly easy workable slopes to 300 feet above lake. Soil, chiefly a black loam over a sandy loam, suitable for fruit growing, of 50 per cent value, stony and rocky on some slopes, timbered with fir, cedar and small brush, occasional fir to 30 inches diameter on slopes, smaller on flat, cedar to 12 inches diameter has been logged on flat. All in timber berth 455. A squatter, Reedman, junior, has located on SE. $\frac{1}{4}$ and built a log house.

Tp. 23, R. 10, W. 6th Mer. *A. O. Wheeler, D.L.S., 1908.*

FRAC. SEC. 8.—Chiefly uneven high land rising from lake to 600 feet and up, northeast portion gently rolling bench land, 350 to 400 feet above lake, soil, sandy loam, stony and rocky on high land, not well suited for agriculture, bench land first class for agriculture; Meadow creek flows through northeast $\frac{1}{4}$ section; timber, land largely burned over, SW. $\frac{1}{4}$ and SE. $\frac{1}{4}$ fir to 30 inches and bull pine to 24 inches fairly

frequent, has been partly logged, NW. $\frac{1}{4}$ and NE. $\frac{1}{4}$, scattered fir 18 to 30 inches, cedar to 18 inches, spruce to 10 inches, of lumber value, included in timber berth 240.

FRAC. SEC. 9.—Rolling bench land with general fall to lake, from lake level to 300 feet above, soil, sandy and clayey loam, good agricultural land; timber, scattered fir to 24 inches, white pine to 15 inches, a few bull pine to 16 inches, not much lumber value, balance small stuff, section has been logged, largely burned over during past summer, included in timber berth 240.

FRAC. SEC. 10.—Rolling bench land rising to 250 feet above lake, soil, sandy and clayey loam, rocky near shore, some fair agricultural land, timber, fir, cedar, white pine, birch, spruce, with maple and mixed brush; scattered fir to 18 inches, occasional to 28 inches, occasional pine to 14 inches, of lumber value; has been partly logged, included in timber berth 240.

FRAC. SEC. 11.—Chiefly bottom land, rising to 50 feet above lake; soil, sandy loam, very stony and rocky on bench land, not so stony on flat, some very good agricultural land through flat; no timber of any lumber value; included in timber berth 240.

FRAC. SEC. 13.—Bench land rising from lake shore to 450 feet above, general fall to lake, soil, sandy and clayey loam, rather stony, some good agricultural land; timber, small birch, fir, cedar, spruce, and poplar with occasional fir and cedar to 24 inches in diameter of very little lumber value, included in timber berth 240.

SEC. 14.—Uneven bench land, rising from lake level to 450 feet above, soil, sandy and clayey loam, very stony and rocky in parts, some fair agricultural land; timber, small fir, birch, spruce, pine, poplar, hemlock, cedar and maple, a few scattered fir from 15 to 28 inches diameter, of very little lumber value, included in timber berth 240.

SEC. 15.—South $\frac{1}{2}$ general slope to lake, north $\frac{1}{2}$ rolling bench land from 350 to 450 feet above Shuswap lake, soil, sandy and gravelly on south half, sandy and clayey loam on north half, some very good agricultural land, particularly in low land and meadows, where rich dark loam is found; timber, northwest $\frac{1}{4}$ fir to 36 inches, cedar (scraggy) to 36 inches, occasional spruce to 20 inches, and white pine to 20 inches, good lumber value, northeast $\frac{1}{4}$ scattered cedar to 24 inches along Manson creek but seems all dead, no other timber of lumber value, all small, southeast $\frac{1}{4}$ small birch, poplar, fir and jack pine, southwest $\frac{1}{4}$ ditto; has been logged, included in timber berth 240.

SEC. 16.—Gently rolling bench land from 300 to 400 feet above Shuswap lake, soil, sandy and clayey loam, some very good agricultural land; timber, section badly burned over this summer, most of valuable timber killed, has been logged previously, included in timber berth 240.

SEC. 17.—Rolling bench land from 500 to 700 feet above Shuswap lake, soil, reddish brown sandy loam with whitish clay subsoil, a few stones and gravel on higher parts, good agricultural land; timber, a good sprinkling of fir to 30 inches, cedar to 24 inches, birch, hemlock, etc., small, all above of good lumber value, included in timber berth 240, northeast $\frac{1}{4}$ largely burned over this summer and valuable timber destroyed.

SEC. 18.—For the most part gently rolling bench land 500 feet above Shuswap lake, in S. $\frac{1}{2}$ of NW. $\frac{1}{4}$ and N. $\frac{1}{2}$ of SW. $\frac{1}{4}$ is a fine piece of cultivated meadow land, A. H. Fowler has been granted an entry for these legal subdivisions, soil, reddish brown sandy loam with whitish clay subsoil, a few stones, first-class agricultural land, timber generally fir, cedar, hemlock, spruce, white pine and brush, on southeast $\frac{1}{4}$ fir to 30 inches, cedar to 24 inches, spruce to 18 inches, on southwest $\frac{1}{4}$ and northwest $\frac{1}{4}$ fir and cedar to 30 inches, spruce to 24 inches, on northeast $\frac{1}{4}$ scattering of cedar to 30 inches and fir to 24 inches diameter in extreme north part, all above of lumber value, included in timber berth 240, has been logged to some extent.

SW. CORNER, SEC. 18, FRAC. SEC. 7.—Uneven high land of questionable agricultural utility, rising from Shuswap lake to 1,100 feet and up, soil, usual sandy loam, very stony and rocky in parts, particularly as lake is approached, timber, land largely

burned over. NW. $\frac{1}{4}$ and SW. $\frac{1}{4}$ scattered fir to 24 inches, occasional to 30 inches, cedar to 14 inches, bull pine along lake, SE. $\frac{1}{4}$ and NE. $\frac{1}{4}$ scattered fir to 24 inches, bull pine to 24 inches along lake, all above trees of lumber value, included in timber berth 240, has been partly logged.

SEC. 19.—Chiefly high land of very questionable utility for agricultural purposes, elevation 500 feet above Shuswap lake and up, soil, reddish or brownish sandy loam with stones and gravel. Timber all small, fir, birch, cedar, white pine, poplar, hemlock and usual small brush, no timber of lumber value, included in timber berth 240.

SEC. 20, S. $\frac{1}{2}$.—Chiefly bench land from 650 to 900 feet above Shuswap lake, soil dark sandy loam with gravel in parts, black loam in low places, very good agricultural land, timber, on southwest $\frac{1}{4}$ good fir to 40 inches, cedar to 36 inches, hemlock to 24 inches (scraggy), on southeast $\frac{1}{4}$ timber smaller, scraggy cedar to 30 inches and sprinkling of fir to 40 inches, not very good lumber value, included in timber berth 240.

SEC. 20, N. $\frac{1}{2}$.—Chiefly high land, poor agricultural land-soil, stony, timber small, no lumber value, included in timber berth 240.

SEC. 21.—Northwest $\frac{1}{4}$ chiefly high land, poor agricultural land, timber of no lumber value, south $\frac{1}{2}$ and northeast $\frac{1}{4}$ bench land 400 to 900 feet above Shuswap lake, soil brown sandy loam, stony in parts, some very good agricultural land, timber, small fir, white pine, birch, cedar and poplar, practically no timber of lumber value, section largely burned over during past summer.

SEC. 22.—Rolling bench land from 400 to 800 feet above Shuswap lake, south half undulating easily, north half rising irregularly, soil, reddish sandy loam, north half stony and gravelly, south half, some very good agricultural land, Manson creek flows through east half, timber, occasional fir to 20 inches, of very doubtful lumber value, balance of timber small, generally old brulé, all good timber has been fire killed, included in timber berth 240.

SEC. 23.—Bench land, north half general easy rise to mountain from 500 to 1,000 feet above lake, soil, sandy and clayey loam, stony in parts some good agricultural lands, timber, small fir, pine, cedar, birch, spruce and hemlock, occasional fir and cedar to 20 inches diameter of little lumber value, included in timber berth 240.

SEC. 24.—Bench land, south half undulating, from 450 to 550 feet above lake, north half general rise to mountain slopes from 550 to 1,000 feet above lake, soil, sandy and clayey loam, stony and gravelly in parts, some very good agricultural land, timber, small fir, white pine, cedar, birch, spruce, hemlock and maple, occasional cedar and fir to 24 inches diameter, generally of not much lumber value, included in timber berth 240.

SEC. 27.—May be classed as high land, broken and steeply rising, only suitable for agriculture in patches, no timber of lumber value, Manson creek and a branch of it flow through the section in deep canyons, 300 feet deep on main stream, included in timber berth 240.

T. H. Plunkett, D.L.S., 1910.—There is a large area of good agricultural land along the northerly shore of Shuswap lake, extending back an average distance of about 3 miles from the water. The land has two main benches, the lower, with an average breadth of about a quarter of a mile, and the higher, about two and a half miles wide, both extending the whole length of the township. The soil on the lower bench is inclined to be gravelly in places, and hence is not altogether suitable for agriculture. The higher bench, however, is admirably suited to agriculture, the soil in secs. 15, 16, and 17 and the south halves of secs. 21, 22 and 23, being for the most part a rich black loam with a gravel or gravelly clay subsoil, and the remaining portions of the bench having a brown sand or clay loam with a subsoil of gravel or gravelly clay. The timber consists of fir, cedar and hemlock from one to two feet in diameter, and in addition spruce, birch and poplar up to eighteen inches in diameter are found. The undergrowth consists of alder and willow brush with scrub maple, and is very dense, rendering clearing a very difficult task both on account of the labour and the entire lack of feed for horses. Fruit raising in this vicinity has not been

developed, but wherever tried it has been without exception remarkably successful. The climate is well adapted to fruit growing or mixed farming. Irrigation will likely be necessary in some parts, but excellent facilities for it occur. Deer, bears, and lynx are plentiful.

L. D. N. Stewart, D.L.S., 1910.—(Partial).—The only route to this district available at present is by Shuswap lake. The surface rises abruptly from the lake to a height of several hundred feet in half a mile, and these sections are timbered with a thick second growth of fir, cedar, birch, poplar, hemlock and spruce. Scattered fir and cedar from 16 to 24 inches in diameter are also found but not in sufficient quantities to make them valuable as a timber limit. There is no hay. No water-powers are available, and fresh water is obtained in Shuswap lake only, the streams running dry in summer. Wood is obtainable for fuel. Game consisting of grouse and deer is plentiful, and all kinds of trout also abound. The climate is excellent being similar to that of the Niagara peninsula, although there is less rain here in the months of July, August and September. No stone-quarries nor minerals were found.

Tp. 17, R. 11, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 13, N. $\frac{1}{2}$; SEC. 14, N. $\frac{1}{2}$; SEC. 15, NE. $\frac{1}{4}$, E. $\frac{1}{2}$ NW. $\frac{1}{4}$.—Steep mountain side covered with poplar, willow, small fir, and jack pine, too steep and rocky for cultivation and with too much underbrush for grazing, worthless in present condition.

SEC. 16, S. $\frac{1}{2}$; SEC. 17, S. $\frac{1}{2}$.—Nearly all steep mountain side overgrown with thick willow, poplar, small fir and jack pine, a few large fir but no timber value. There is a narrow bench along north side which might be of some value for fruit or farming, elevation about 700 to 900 feet above Shuswap lake, soil, sandy clay loam with a good deal of stone.

SEC. 17, N. $\frac{1}{2}$.—Rolling land consisting of slopes and benches facing north and 600 to 1,000 feet above Shuswap lake, light clay with black loam in hollows very stony on ridges, poplar, willow, alder, small fir and jack pine, no timber value, value as fruit land about 30 per cent.

SEC. 19, SW. $\frac{1}{4}$.—Slopes and benches toward north 600 to 1,100 feet above Shuswap lake, very rough, light clay loam with much gravel and very stony in places, small fir, jack pine, willow and poplar, no timber value in timber berth 441 (5), value as fruit land 20 per cent.

SEC. 20, N. $\frac{1}{2}$; SEC. 21, N. $\frac{1}{2}$, N. $\frac{1}{2}$ SE. $\frac{1}{4}$.—Very steep rocky hillside from 500 to 2,300 feet above Shuswap lake, sandy clay with much rock, fir and bull pine to 24 inches diameter, small lumber value, open with bunch grass, good grazing land.

SEC. 23, SE. $\frac{1}{4}$.—A rough rocky ridge running out toward the Salmon river, covered with willow, poplar and jackpine, of no value in present condition.

SEC. 25, E. $\frac{1}{2}$ SE. $\frac{1}{4}$.—Land formerly homesteaded but recently cancelled and not examined, will probably be rolling bench land 500 to 600 feet above Shuswap lake, light sandy clay, scattered fir and bull pine, of value as fruit land.

SEC. 26, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 27, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 28, S. $\frac{1}{2}$; SEC. 29, S. $\frac{1}{2}$; SEC. 30, E. $\frac{1}{2}$; SEC. 31, W. $\frac{1}{2}$; SEC. 36, S. $\frac{1}{2}$.—Steep hillside from 450 to 2,835 feet above Shuswap lake, light clay loam with much gravel, stone and rock, rock cliffs in places, open, fir and bull pine to 24 inches diameter, small lumber value, much pine and bunch grass, land is too rough and rocky for cultivation, but much of it would make good grazing land, sec. 31 is included in timber berth 441 (3.)

SEC. 36, NE. $\frac{1}{4}$.—Steep rocky hillside 1,220 to 1,660 feet above Shuswap lake, sandy clay, very stony, scattered fir and bull pine to 20 inches with much underbrush, small timber value, too rough and rocky for cultivation and too brushy for grazing.

SEC. 36, NW. $\frac{1}{4}$; SEC. 35.—Rolling bench land 1,300 to 2,200 feet above Shuswap lake, sandy clay loam with much stone in places, thick small fir, cedar, poplar and birch, scattered fir and bull pine up to 20 inches, small timber value some of land is suitable for farming, but the elevation is so great that it is doubtful if it could be used successfully.

J. E. Ross, D.L.S., 1909.—The land surveyed in this township consists of sec. 17 on the south side of Salmon river, and several quarter sections on a high hill to the north of the river. The land in sec. 17 is easily accessible from the Okanagan road, being 24 miles from Vernon. Every quarter in this section compares well with the average land that is being taken up in the Railway Belt at present. There is a fair rainfall, and irrigation while certainly beneficial is not strictly necessary. There are a few small streams along the foot of the mountain to the south, but these go underground before reaching the section; however, water could probably be obtained in wells. While there is no large timber, a dense growth of young fir and black pine covers the whole section, giving place in spots to alder bottoms. The ground rises gradually to the south, having an elevation of from 1,800 to 2,300 feet. The soil is generally a light sandy loam, stony in places, and there is a good growth of grass over all the section. The signs of bear are plentiful. An Indian trail, in fair condition, runs from the Okanagan reserve along the south of Salmon river, to a lake known locally as Pinaus lake, which lies to the west, about the boundary of the Belt. The land to the north of Salmon river consists of a steep rocky hillside, covered in places with bull pine and rising 2,000 feet above Salmon river, or 3,800 feet above sea-level. The top of this hill is a plateau, covered with open forests of pine and fir averaging 3 feet in diameter and covered with an abundance of bunch grass. To the north the ground gets hilly and the grass gives way to tangled brush. In the latter part of July there was no water whatever on this flat, but some alder bottoms had the appearance of having gone dry only recently. The land is difficult of access, but a steep horse trail could be made from a point on the Okanagan road, about 21 miles from Vernon. On account of its elevation and aridity the land is unsuitable for agriculture, but the open glades would make excellent pasture. The pine and fir are of good quality and could be logged without any special difficulty. Saskatoon berries grow luxuriantly throughout the whole township.

Tp. 18, R. 11, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 6, SW. $\frac{1}{4}$.—Rolling bench land broken in the SE. corner by steep hillside, bench land 1,000 to 1,300 feet above Shuswap lake, much poplar, small fir, etc., scattered large fir, very low timber value, about 100 acres would class about 40 per cent farm land.

NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Nearly all steep mountain side 1,300 to 3,000 feet above Shuswap lake, sandy clay loam with much stone, much small fir, cedar and poplar with fir and cedar to 15 inches diameter, timber value, about 10 to 15 acres in each quarter section might be suitable for farming.

SEC. 12, NE. $\frac{1}{4}$.—Steep rock bluffs 650 feet and upwards above Shuswap lake, small jack pine, fir, poplar and willow brush, of no value for cultivation or grazing.

SEC. 13, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land with main slopes to east 615 to 1,245 feet above Shuswap lake, most of land 600 to 800 feet above lake, small jack pine, fir, poplar, willow and birch, scattered large fir, no timber value, light clay loam with gravel, stony in places, value about 50 per cent as fruit or farm land. There is a squatter on each $\frac{1}{4}$ section, Jacob Sturn on NE. $\frac{1}{4}$ and Stoddart on the SE. $\frac{1}{4}$. There is a good stream through each $\frac{1}{4}$ section.

SEC. 13, W. $\frac{1}{2}$; SEC. 24, W. $\frac{1}{2}$.—Rolling bench land with main slopes to the east 800 to 1,300 feet above the Shuswap lake, sandy clay to clay loam very stony on ridges, fir, cedar, jack pine, poplar, birch, very doubtful timber value. There is good farm land in some of the hollows, but most of it is poor, value for farming about 25 per cent.

SEC. 24, E. $\frac{1}{2}$.—Rolling bench land facing east 620 to 1,165 feet above Shuswap lake, sandy clay with much stone and gravel, fir and bull pine to 18 inches diameter, possible timber value, land is rather rough but lower slopes might be suitable for fruit, value about 30 per cent.

SEC. 25, SEC. 36.—Rolling bench land 800 to 1,700 feet above Shuswap lake, light clay loam with much stone and gravel occasional rock outcrops, nearly all old brûlé

overgrown with small cedar, fir and jack pine, much windfall, scattered large fir along east side, no timber value, land is poor but some of it might be suitable for farming, probable value as farm land 20 per cent.

Tp. 19, R. 11, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 1, E. $\frac{1}{2}$; SEC. 12, E. $\frac{1}{2}$; SEC. 13, E. $\frac{1}{2}$.—Steep rocky mountain side, old brûlé overgrown with poplar, willow, small fir and jack pine, no agricultural value, and nearly all of it too brushy for grazing, the only land that could be cultivated is a small area in SE. corner sec. 1, south of Silver creek.

SEC. 36, FRAC. SE. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Steep mountain side rising 150 feet and upwards above Shuswap lake, sandy clay loam, very stony with rock outcrops, scattered fir and bull pine to 18 inches, much underbrush, small timber value, some of land is of use for grazing but most of it is too brushy.

Tp. 20, R. 11, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 7, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 18, SE. $\frac{1}{4}$; SEC. 17, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Rolling bench land 2,200 feet to about 2,650 feet above Shuswap lake, sandy clay loam with much stone, much jack pine with some small fir, poplar and willow, no timber value, too much brush for grazing, much of the land would be suitable for cultivation but it is so high that it is of doubtful value. Charcoal creek flows through this tract but it is very doubtful if it could be irrigated.

Tp. 21, R. 11, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 7, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, E. $\frac{1}{2}$ NW. $\frac{1}{4}$.—Rolling bench land 700 to 1,000 feet above Shuswap lake, SE. $\frac{1}{4}$ broken by steep mountainside, white sandy clay, fir about 1 foot diameter, with much small fir and cedar, timber value, most of land is too rough to be of any value for farming. There is a large stream through the east side of section.

SEC. 8, N. $\frac{1}{2}$; SEC. 9, N. $\frac{1}{2}$; SEC. 10, N. $\frac{1}{2}$ NW. $\frac{1}{4}$, N. $\frac{1}{2}$ NE. $\frac{1}{4}$.—Land lying in valley bottom level or slightly rolling, 660 to 800 feet above Shuswap lake, NW. $\frac{1}{4}$, sec. 8, and some land along south broken by mountain slopes, light clay to clay loam, stony in places, fir, cedar and spruce 1 foot to 2 feet diameter, with much underbrush, lumber value, in timber berth 242, land would be suitable for fruit and some would be suitable for farming, value of NW. $\frac{1}{4}$, sec. 8, as fruit land about 25 per cent, value of remainder 50 per cent.

SEC. 11, N. $\frac{1}{2}$; SEC. 13, SE. $\frac{1}{4}$.—Steep hillside 800 feet and upwards above Shuswap lake, sandy clay with much stone, cedar, fir, white pine and spruce to 16 inches diameter, much underbrush, timber value in sec. 11, all included in timber berth 242, land of no value for cultivation or grazing in present condition.

SEC. 13, SW. $\frac{1}{4}$.—Bench land 640 feet to 920 feet above Shuswap lake and broken to south by slopes of mountain, sandy clay loam with stone and gravel, cedar, fir and spruce to 16 inches diameter, much underbrush, timber value in timber berth 242, some of land would be suitable for farming and much of it would be suitable for fruit, value as fruit land about 50 per cent.

SEC. 13, NE. $\frac{1}{4}$.—Rolling bench land broken in SE. by mountain slopes 370 to 1,000 feet above Shuswap lake, light clay loam, fir, spruce, cedar, hemlock, etc., to 1 foot diameter, very small timber value, in timber berth 242, value as fruit land 60 per cent.

SEC. 13, NW. $\frac{1}{4}$; SEC. 14, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$, S. $\frac{1}{2}$ NW. $\frac{1}{4}$.—Level benches, or easy slopes lying near bottom of valley, nearly all of land being 530 to 800 feet above Shuswap lake, fir, and pine to 20 inches diameter, much underbrush in places, good timber value, included in timber berth 242, light clay loam rather stony in places, good fruit or farm land value as fruit land about 65 per cent.

SEC. 14, N. $\frac{1}{2}$ NW. $\frac{1}{4}$; SEC. 15, NE. $\frac{1}{4}$, FRAC. NW. $\frac{1}{4}$, NOT IN C. G. 499.—Rough bench land 660 to 1,200 feet above Shuswap lake, light clay loam, stony and rocky in

places, fir and bull pine to 18 inches diameter, partially open with pine grass, good timber value in timber berth 451, very little of land would be suitable for cultivation, of some value for grazing.

SEC. 15, SE. $\frac{1}{4}$, FRAC. SW. $\frac{1}{4}$, NOT IN C. G. 499; SEC. 16, FRAC. SE. $\frac{1}{4}$, NOT IN C. G. 499, S. $\frac{1}{2}$ SW. $\frac{1}{4}$.—Low bench land lying near bottom of valley 520 to 650 feet above Shuswap lake, red sandy clay loam, stony in places, fir and cedar to 1 foot diameter, much underbrush in places, fair timber value, in timber berth 242, land would be suitable for fruit or farm, value as fruit land 65 per cent, S. $\frac{1}{2}$ sec. 15 is broken by two small sloughs which are partially dry during dry weather.

SEC. 16, FRAC. N. $\frac{1}{2}$ SW. $\frac{1}{4}$ AND NW. $\frac{1}{4}$, NOT IN C. G. 499; SEC. 17.—Rough broken hillside 650 to 2,300 feet above Shuswap lake, sandy clay, very stony with rock outcrops, fir and bull pine to 20 inches diameter, lumber value, SW. $\frac{1}{4}$ sec. 16 and S. $\frac{1}{2}$ sec. 17 included in timber berth 242; remainder included in grazing lease 3319, land is partially open with much pine grass and a little bunch grass. A small strip of about 10 chains wide along the south side of sec. 17 might be of value for fruit growing or farming; the remainder is of no value except for grazing.

SEC. 18, NE. $\frac{1}{4}$.—Rather rough bench land 690 to 1,600 feet above Shuswap lake, light clay loam, stony, fir and bull pine to 20 inches diameter, small timber value a few acres of good farm or fruit land in SW. corner, but most of $\frac{1}{4}$ section is suitable for grazing only, it is included in grazing lease 3319.

SEC. 19, L. S. 3, 5, 6, SE. $\frac{1}{4}$.—Steep rocky cliffs with scattered fir and bull pine to 20 inches diameter, very doubtful timber value, too rough and rocky for grazing included in grazing lease 3319.

SEC. 20, S. $\frac{1}{2}$; SEC. 21, S. $\frac{1}{2}$, NOT IN C. G. 499.—Steep, rocky hillside 1,500 to 2,500 feet above Shuswap lake, scattered fir and bull pine to 20 inches diameter, small lumber value, much underbrush in places, pine grass and bunch grass in places, fair grazing land, held under lease 3319.

SEC. 22, S. $\frac{1}{2}$ NOT IN C. G. 499.—Steep slopes with some benches 1,100 to 2,000 feet above Shuswap lake, light clay loam, stony in places, fir and bull pine to 20 inches diameter, lumber value, in timber berth 451, much pine grass with bunch grass to north, fair grazing land, some benches on the east side of SE. $\frac{1}{4}$ would be suitable for farming if not too dry, there is no apparent means of irrigation.

SEC. 23. SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Slopes facing SE. in SE. $\frac{1}{4}$ rising from 670 feet above Shuswap lake to rolling bench land 1,100 to 1,400 feet above in the SW. $\frac{1}{4}$, sandy clay, stony with some rock outcrops, fir up to 16 inches, with much underbrush, small timber value, included in timber berth 451, of rather doubtful agricultural value and very brushy for grazing, probable value as farm land 20 per cent, very dry and without means of irrigation.

NE. $\frac{1}{4}$.—Rough rolling bench land and steep slopes 950 feet and upwards above Shuswap lake, sandy clay loam very stony, thick small fir, cedar, poplar and willow, no timber value, SE. part of $\frac{1}{4}$ section would class 30 per cent farm land, very dry and without irrigation.

SEC. 24, S. $\frac{1}{2}$.—Level benches and slopes rising to NW. 300 to 900 feet above Shuswap lake, sandy clay loam stony in places, much jack pine, willow and small fir, fir to 16 inches diameter, timber value, in timber berth 242, value as fruit land about 50 per cent.

Tp. 22, R. 11, W. 6th Mer.

J. E. Ross, D.L.S., 1909.—The district surveyed here lies between a high mountain and Shuswap lake. The land suitable for settlement had already been nearly all surveyed and I completed the survey. In elevation the land extends from 1,600 feet to 3,200 feet above sea-level, and a great deal of it is precipitous hillside, very densely wooded with small fir, jack pine and brush. Numerous small creeks flow down the side of the mountain. In a few quarter sections that are worth taking up the settlers have made considerable improvements. The land is all easily accessible from the Canadian Pacific railway at the village of Notch Hill. In the best quarter sections

the soil is a good sandy loam in which fruit and produce would do well, and irrigation would hardly be necessary.

G. H. Blanchet, D.L.S., 1911.—The Canadian Pacific railway main line crosses this township in a northwesterly direction, passing through the southeastern corner. The station of Notch Hill is situated in the southeastern quarter of section 10, and from here provincial roads run northwest, north and east and, together with private roads, render all parts of the township of agricultural value easily accessible. The soil on the slopes varies from a clay loam to a sandy loam and gravel, while portions of the valley bottom along the railway have a black loam surface of considerable depth. The portion of the township surveyed south of the railway rises fairly steeply to the south, and is rough and heavily timbered for the most part. Between the railway and Shuswap lake lies the western portion of Notch hill which rises several hundred feet above the railway, and then drops about 700 feet to the level of the lake. The slopes are probably suitable for fruit growing, while the valley bottom is best adapted to hay, grain and vegetables. The township has been covered with a heavy growth of fir, cedar and pine, but this has been, for the most part, either logged or burnt off, and is now replaced by a very thick second growth. There is no natural hay land, and surface water is scarce except along the valley of the railway, where there are several creeks. There are no water-powers. This district, being near the eastern border of the Dry Belt, the summers here are dry and very warm, promoting rapid growth where sufficient water is obtainable. Summer frosts are rare and the winters as a rule are mild. No coal nor lignite were found, but wood for fuel is abundant. No stone nor minerals of economic value were observed. Salmon and trout are obtained from the lake, and a few deer, caribou and bears roam on the higher slopes of the hills.

M. P. Bridgland, D.L.S., 1909.—SEC. 2, SW. $\frac{1}{4}$; SEC. 3, S. $\frac{1}{2}$, SEC. 4, N. $\frac{1}{2}$, SEC. 8, N. $\frac{1}{2}$; SEC. 9 SW. $\frac{1}{4}$; SEC. 17, SE. $\frac{1}{4}$, SOUTH C.P.P.R.; SEC. 18, S. $\frac{1}{2}$.—Steep broken slopes facing north 550 feet and upwards above Shuswap lake, sandy loam very stony with frequent rock outcrops, very thick small fir, poplar, willow and birch scattered spruce and fir up to 18 inches diameter, small timber value, of no value for agriculture or grazing, SW. $\frac{1}{4}$ sec. 2 and S. $\frac{1}{2}$ sec. 3 included in timber berth 306.

A. O. Wheeler, D.L.S., 1908.—SEC. 10, NE. $\frac{1}{4}$.—Rolling bench land 300 to 700 feet above the Shuswap lake, soil, sandy and clayey loam, good agricultural land, timber, fir, cedar, birch and pine, scattered fir of good lumber value throughout, fir to 30 inches, included in timber berth 455.

SEC. 11, N. $\frac{1}{2}$, SE. $\frac{1}{4}$.—Rolling bench land, 800 to 900 feet above Shuswap lake, soil, sandy and clayey loam, good agricultural land, timber, old brûlé on northwest $\frac{1}{4}$, partly logged, fir to 18 inches fairly frequent, northeast $\frac{1}{4}$, frequent fir to 24 inches, occasionally to 30 inches, southeast $\frac{1}{4}$ a few fir to 15 inches diameter, other timber small cedar, fir, birch and pine. Included in timber berth 455.

SEC. 12; SEC. 1, NE. $\frac{1}{4}$, N. $\frac{1}{2}$ of NW. $\frac{1}{4}$.—Rolling bench land, 500 to 900 feet above Shuswap lake, soil, sandy loam, clay subsoil, good agricultural land in parts, fair throughout, timber, birch, poplar, fir, cedar, pine and usual brush, northeast $\frac{1}{4}$ sec. 12 very little fir or pine of lumber value, partly logged, partly burned over, balance of sec. 12 and part of sec. 1 scattered fir and bull pine to 24 inches, lumber value good on southwest $\frac{1}{4}$ sec. 12 and northern half of northwest $\frac{1}{4}$ sec. 1. Included in timber berths 71 and 455.

SEC. 13.—General rolling slopes to southeast from 300 to 850 feet above Shuswap lake, soil, sandy loam, good agricultural land, timber small fir, birch, poplar and cedar, fir to 24 inches diameter scattered throughout, of lumber value, included in timber berths 239, 455 and 71.

SEC. 14, FRAC. NW. $\frac{1}{4}$, N. $\frac{1}{2}$ OF NE. $\frac{1}{4}$.—Entry granted.

SEC. 14, S. $\frac{1}{2}$ OF NE. $\frac{1}{4}$, S. $\frac{1}{2}$.—General rolling rise to south, 400 to 900 feet above lake, soil sandy and clayey loam, good agricultural land, timber, small birch, cedar

and usual brush, good fir to 30 inches diameter in S. $\frac{1}{2}$ of southeast $\frac{1}{4}$, smaller fir to 20 inches, scattered throughout, probably of lumber value, southwest $\frac{1}{4}$ has been logged but frequent fir to 18 inches still remain, included in timber berths 239 and 455.

SEC. 15; SEC. 10, NE. $\frac{1}{4}$.—General rise to south to 900 feet above Shuswap lake, soil sandy and clayey loam with stones and gravel in parts, a few rock outcrops, timber small birch, fir, poplar, cedar, pine and occasional spruce, fir to 30 inches and pine to 2 feet diameter, of lumber value, scattered throughout, some good lumber timber on southwest $\frac{1}{4}$, burned over and logged over in parts, included in timber berth 239 and 455.

SEC. 23, FRAC. SW. $\frac{1}{4}$.—Chiefly flat and easy slope from lake shore, soil, sandy loam, good agricultural land, no timber of lumber value, included in timber berth 455.

FRAC. SEC. 24; SEC. 23, FRAC. SE. $\frac{1}{4}$.—Entries granted.

A. O. Wheeler, D.L.S., 1909.—SEC. 31, NW. $\frac{1}{4}$ AND FRAC. E. $\frac{1}{2}$.—Steep and broken slopes, to about 1,200 feet above Shuswap lake; soil, sandy loam, very stony, thickly scattered Douglas fir to 18 inches and scattered bull pine to 20 inches, lumber value; of no agricultural value.

SEC. 34, NE. $\frac{1}{4}$.—The east half of this quarter is bench land, elevation 800 to 1,000 feet above Shuswap lake, soil, sandy loam, rather stony, small lake in SE. corner of L.S. 16. Land around swampy with cedar to 10 inches east half 40 per cent fruit land, west is badly broken, steep rocky slopes, thickly scattered Douglas fir and bull pine to 20 inches, of lumber value, no agricultural value.

SEC. 35, NW. $\frac{1}{4}$.—The west half of quarter is fairly level bench land, elevation about 900 feet above Shuswap lake; soil, sandy loam, very stony, small lake in SW. corner of L.S. 13, land around lake swampy with cedar to 10 inches, scattered Douglas fir and bull pine to 20 inches, thick poplar and willow scrub, value 40 per cent fruit land, remainder of quarter steep and broken slopes, very stony and rocky, scattered fir to 18 inches, fair lumber value, scrub poplar, of no agricultural value.

NE. $\frac{1}{4}$, FRAC.—Steep rocky slopes, scattered fir to 18 inches, lumber value, scrub fir, birch and willow, of no agricultural value.

TP. 23, R. 11, W. 6th Mer. A. O. Wheeler, D.L.S., 1908.

SEC. 13, NE. $\frac{1}{4}$.—A fine piece of meadow flat on this $\frac{1}{4}$ section, has already been cultivated by H. A. Fowler, 500 feet above Shuswap lake, soil, a light clay with sandy loam on higher portions, timber on this $\frac{1}{4}$ section is a valuable bunch of lumber timber, cedar to 4 feet diameter, occasionally to 5 feet, spruce to 2 feet diameter, white pine to 4 feet diameter, fir to 4 feet diameter, occasionally to 5 feet, included in timber berth 240.

A. O. Wheeler, D.L.S., 1908.—PART SEC. 23; PART SEC. 24.—In these sections there is a small valley of Meadow creek, running northwesterly to the valley of Scotch creek, containing an area of agricultural lands, elevation above Shuswap lake 500 to 800 feet. The valley at the bottom is narrow, but the side slopes and benches can be utilized for some distance; in section 23 there is a small fairly level plateau of about 300 acres immediately above Scotch creek; soil, reddish or brownish sandy loam, stony in steeper parts, subsoil, whitish marl-clay; timber, small scrubby fir, poplar, birch, cottonwood and white pine, and spruce and jack pine on plateau, no timber of lumber value, included in timber berth reserve 240.

A. O. Wheeler, D.L.S., 1909.—APPROXIMATELY IN SECS. 15, 10, 11, 3 AND 4.—Along Scotch creek on west side is a strip of bench land from 150 to 300 feet above Shuswap lake, and 5 chains to 10 chains wide; might possibly be utilized for agriculture of about 15 to 20 per cent value; soil, light loam, very stony; timber small and of no lumber value. Below this bench land, along slope of creek, on both sides is a narrow strip of flat, subject to overflow. Very stony and of doubtful agricultural value. Is timbered, some few trees of lumber value, in timber berth 240.

APPROXIMATELY IN SEC. 22.—An area of bench land, rising easily to west, 500 feet above Shuswap lake. Some good land suitable for agriculture of a 50 per cent to 75 per cent value; soil, rich sandy loam, stony on slopes; timber second growth birch, poplar, fir and brush (willow, maple, cedar and spruce), no lumber value. Beyond to west are heavily timbered slopes reaching high up. In timber berth 240.

APPROXIMATELY IN SEC. 27.—An area of bench land rising easily to west, 600 feet above Shuswap lake; might be used for agriculture if it can be irrigated, probably can be irrigated; of about 30 per cent to 40 per cent agricultural value; soil, light reddish sandy loam, very stony and dry; timber, second growth of jack pine, fir, birch, poplar and undergrowth. Beyond to west are heavy timbered slopes reaching high up. In timber berth 240.

J. E. Ross, D.L.S., 1909.—The land surveyed here consists of the valley of Meadow creek and a bench overlooking the rugged valley of Scotch creek. The elevation of the land is about 800 feet above Shuswap lake, and a passable road extends from the lake, at the mouth of Meadow creek to the place where I began the present survey. From the end of this road to Scotch creek there is a fair trail. The land is generally brushy bottom land, but in places there is a dense growth of cedar. The valley is well adapted to mixed gardening. On the bench overlooking Scotch creek fruit might be raised. Three settlers have done considerable improvements on the quarter sections on which they have squatted, and there are several more quarter sections which could be taken up.

Tp. 24, R. 11, W. 6th Mer. *A. O. Wheeler, D.L.S., 1909.*

APPROXIMATELY IN SEC. 3 E. APPROXIMATELY **Tp. 23, R. 11.** APPROXIMATELY IN SECS. 34 AND 27.—Small area of bench land, 700 to 800 feet above Shuswap lake; might be used for agriculture if irrigated, can probably be irrigated; of about 30 per cent agricultural value; soil, light reddish loam very gravelly and stony; timber, second growth jack pine, birch and undergrowth, no lumber value. Beyond the bench land, to the west, appears heavy timber reaching high up on the slopes. All township 23, range 11 in timber berth 240.

Tp. 25, R. 11, W. 6th Mer. *E. W. Robinson, D.L.S., 1909.*

This township lies to the east of Adams lake and extends across the divide between Adams lake and the north fork of Scotch creek and crossing this creek rises from half a mile to two miles up the opposite slope. It is best reached in summer from Chase, on the main line of the Canadian Pacific railway, thence by Adams River Lumber Company's tug on Little Shuswap lake to their warehouse at the northerly point of the lake. From here an excellent wagon road follows the valley of Adams river to the "dam camp" at the south end of Adams lake, a distance of about 9 miles. The company have a steamboat on Adams lake with accommodation for passengers. During the winter if the ice on Little Shuswap lake is unfit for travelling, the best route is from Squilax Siding on the main line of the Canadian Pacific railway, thence across Shuswap channel by canoe or scow to the Indian reserve on the north side. An excellent wagon road crosses the reserve connecting with wagon road along Adams river. There is no prairie in this township, the whole area being covered with timber or brush. The major portion of the timber lies in the valley of Scotch creek, fires having destroyed what was once a magnificent belt of timber on the Adams lake slope. There are still a few patches left, principally Douglas fir, hemlock and a little white pine. The burnt portions are now covered with dense second growth of the foregoing varieties, and willow, alder and vine-leaf maple. Stretching along the summit between Adams lake and Scotch creek, excellent spruce is found up to 30 inches in diameter with second rate balsam up to 24 inches. As one descends the Scotch creek slope the balsam soon disappears and cedar and hemlock are found. A few cedar up to about 20 inches were discovered to be sound, but the majority are hollow-butted. The hemlock will average fifty per cent unsound, with a greater pro-

portion than this at lower altitudes. The Douglas fir and white pine are the best of the varieties of timber in the township, the fir reaching a size of 60 inches and the pine 40 inches. The soil is a sandy loam with considerable surface rock. Some small hay meadows were found in a low pass approximately in the southwest quarter of section 20. The country generally is of too great an elevation for farming purposes. The climate was reported to be equable, with a sufficiency of rain during the summer. The snowfall is heavy, 7 feet of snow being found on the divide at the end of April. On May 23 snow was still covering the whole of the township. No water-powers exist and no minerals of economic value were found. Some gold placer mines existed at one time on Scotch creek but were soon worked out. "Colours" can still be obtained from most of the sand and gravel bars on this creek. Caribou, deer, black bears, lynx, marten and the smaller fur-bearing animals are fairly numerous.

A. O. Wheeler, D.L.S., 1909.—FRAC. SEC. 16; SEC. 10; SEC. 9.—General easy slopes rising to south, may be classed as fruit land 10 per cent to 50 per cent value to 800 feet above lake; as farm land 10 per cent to 50 per cent value to 1,200 feet above, and beyond as timber lands to crest of highlands; steeper and more broken slopes in places; east half of sec. 10 is much broken by deep valley of mountain torrent; on east, slopes rise steeply up side of round hill; soil, in secs. 16 and 9, light sandy loam, generally stony with gravel in parts; in sec. 10 a good deal of rich dark brown sandy loam with stones and gravel; timber in sec. 10, second growth fir, cedar, jack pine, white pine and birch with thick undergrowth of cedar and hemlock, a few cedar to 20 inches diameter and occasional fir to 20 inches and white pine to 15 inches, of questionable lumber value, as most of larger cedar are dead; in sec. 16, small fir, cedar, birch, white pine and scrub hemlock, scattered fir and lumber value to 20 inches diameter; in sec. 9, good fir to 24 inches diameter, and cedar to 20 inches, of lumber value, other timber, small fir, hemlock, spruce, cedar and white pine.

PART SEC. 19.—Rising back to southeast in fairly easy slopes from Adams lake. May be classed as fruit lands to 800 feet above lake, of 25 to 40 per cent value, and as farm lands to 1,200 feet, of 30 to 40 per cent value; beyond that rises steadily in timbered slopes to crest of highlands. Soil, light sandy loam (brown and yellow), with stones and gravel, very stony in parts. Timber, second growth from 8 inches to 12 inches diameter, of fir, jackpine, birch, poplar, with undergrowth of maple, alder and spruce; all timber in fruit land belt scorched by fire, with patches of open brule; not much timber of value.

PART SEC. 30.—Steep, stony ascent from lake at NW. corner of NW. $\frac{1}{4}$ then fairly easy slopes rising from 150 to 1,200 feet above lake, soil, light sandy loam (brown and yellow) with stone and gravel, very stony in parts, up to 800 feet above lake, might grow fruit if not too stony, would not exceed 40 per cent value, beyond might be suitable for other agriculture; timber, second growth fir, jack pine, cedar, birch, alder, etc., largely scorched by recent fire, scattered fir to 24 inches diameter and cedar to 18 inches, but for the most part scorched and of doubtful lumber value. Beyond the 1,200 feet zone, timber rises to crests of highlands.

Tp. 17, R. 12, W. 6th Mer.—M. P. Bridgland, D.L.S., 1909.

SEC. 24, E. $\frac{1}{2}$.—Rough land consisting of benches and steep slopes facing NE. 500 to 1,100 feet above Shuswap lake; soil, sandy clay loam, very stony; small fir, jack pine and willow brush, scattered large fir, very doubtful timber value, in timber berth 441 (5). Land of doubtful value for agriculture, though some of the lower slopes of the NE. $\frac{1}{4}$ might be suitable for fruit.

SEC. 25, W. $\frac{1}{2}$.—Steep mountain slopes rising from the Salmon river 550 feet and upwards above Shuswap lake, very thick underbrush, small fir, jack pine, etc., no timber value, too much brush for grazing and too rough for cultivation. There are probably a few acres of good land in NE. corner of NW. $\frac{1}{4}$, this quarter was not examined as it was formerly homesteaded and the entry only recently cancelled.

SEC. 30, FRAC. NW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 32, S. $\frac{1}{2}$ SW. $\frac{1}{4}$, S. $\frac{1}{2}$ SE. $\frac{1}{4}$.—Mostly rough hillside 800 feet and upwards above Shuswap lake, sandy clay, much of it very stony, fir and bull pine to 24 inches, small lumber value, much underbrush, pine grass with some bunch grass of some value for grazing. Some gentle slopes in NW. $\frac{1}{4}$ sec. 32 which might be of value for farming or fruit growing, they are very dry and there is no water for irrigation, some of this has been formerly homesteaded and abandoned.

SEC. 29, N. $\frac{1}{2}$.—Steep mountain side with much underbrush and scattered large fir, very doubtful timber value, too steep for cultivation, slopes are open in some places with pine grass and some bunch grass, of some value as grazing land.

SEC. 33, FRAC. N. $\frac{1}{2}$, NOT IN LOT 519; SEC. 35, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—All steep mountain side covered with poplar, willow, small fir, cedar, hemlock, etc., some fir to 1 foot diameter, doubtful timber value, too steep and rough for cultivation, too much underbrush to be of much value as grazing land.

SEC. 36, S. $\frac{1}{2}$ NE. $\frac{1}{4}$.—Steep hillside rising from about 700 to 1,250 feet above Shuswap lake, very rocky, scattered fir, and bull pine to 20 inches diameter, lumber value, pine and bunch grass, fair grazing land.

Tp. 17, R. 12 & 13, W. 6th Mer. *C. H. Taggart, D.L.S., 1911.*

(*Ranges 12 and 13*).—A settler had men clearing and grading a wagon road from the Grand Prairie wagon road to section 19, township 17, range 12. This was a very heavy task as the ascent is about 1,800 feet. The line intersects a small shallow lake of about 15 acres in area which can be readily drained. To the south and west immediately adjoining the lake there are narrow strips of meadow. About 10 chains south of the lake there is a meadow approximately 10 acres in area. This is very wet, but when drained it should be suitable for growing wild hay. Some good grazing land, with plenty of feed, was noticed surrounding these meadows. A small quantity of good fir up to 36 inches in diameter may be found in section 13, township 17, range 13, and in sections 18 and 19, township 17, range 12. Fuel and water are plentiful and I think the latter is permanent on account of the small creeks flowing into Ingram creek. No water-powers, minerals, hay, etc., were noticed. In my opinion, from the situation of this land, summer frosts are liable to occur, and I think nothing but hay and hardy vegetables can be grown.

Tp. 18, R. 12, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 2, SW. $\frac{1}{4}$.—Steep rocky ridge running out from mountains, thick underbrush of small fir, poplar, willow, etc., scattered large fir, possible timber value, no value for cultivation and very little use for grazing.

SEC. 3, N. $\frac{1}{2}$ NW. $\frac{1}{4}$; SEC. 4, N. $\frac{1}{2}$ NE. $\frac{1}{4}$, FRAC. NW. $\frac{1}{4}$; SEC. 5, FRAC. NE. $\frac{1}{4}$; SEC. 9, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 10, SW. $\frac{1}{4}$.—Steep hillside 750 to about 1,800 feet above Shuswap lake, clay loam, stony with occasional rock outcrops, fir and bull pine up to 18 inches, fair timber value in places, much underbrush in places, land is of no agricultural value but would be of value for grazing.

SEC. 5, FRAC. SW. $\frac{1}{4}$; SEC. 6, FRAC. S. $\frac{1}{2}$, NOT IN LOT 518.—Very steep rock cliffs with scattered fir and bull pine, no timber value and no agricultural value, of no value for grazing.

SEC. 10, L. S. 9, 10, 16; SEC. 11, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, N. $\frac{1}{2}$ SE., $\frac{1}{4}$; SEC. 12, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Steep mountain slopes from 750 to 2,200 feet above Shuswap lake, sandy clay loam with much stone and rock, scattered fir and bull pine to 20 inches diameter, small timber value, no agricultural value, pine and bunch grass, fair grazing land.

SEC. 12, SW. $\frac{1}{4}$.—Chiefly mountain slopes 950 to 1,100 feet above Shuswap lake, sandy clay, stony, scattered fir and bull pine to 20 inches diameter, lumber value much small jack pine, most of quarter section is of value for grazing only, but there is a bench about 950 to 1,100 feet high in south side, about 25 acres in extent which might be of use for farming if not too dry.

SE. $\frac{1}{4}$.—Rolling bench land and mountain slopes 1,080 to 1,630 feet above Shuswap lake, light stony clay, some fir and bull pine to 20 inches diameter with a good deal of small fir and jack pine, small timber value, SE. half of $\frac{1}{4}$ section would class about 50 per cent as farm land if not too dry, and the remainder would be grazing land, no water for irrigation.

SEC. 14, S. $\frac{1}{2}$; SEC. 15, N. $\frac{1}{2}$; L. S. 1, 6, 7, 8.—Steep mountain slopes 1,025 to 3,700 feet above Shuswap lake, light clay loam, stony and rocky in places, scattered fir and bull pine to 20 inches diameter with underbrush in places, small timber value, pine and bunch grass, very fair grazing land but too rough for cultivation.

SEC. 15, L. S. 4; SEC. 16, L. S. 1.—Rather rough rolling land in bottom of Bolem Creek valley 900 feet and upwards above Shuswap lake, light clay loam, scattered fir, etc., with underbrush, especially in L. S. 1, no timber value. There is a small area by the creek in each subdivision which would be suitable for fruit or farm land.

SEC. 9, NE. $\frac{1}{4}$; SEC. 16, W. $\frac{1}{2}$; SEC. 20, SE. $\frac{1}{4}$, NW. $\frac{1}{4}$, W. $\frac{1}{2}$ NE. $\frac{1}{4}$; SEC. 30, SE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—All steep mountain slopes lying to the southwest of Bolem creek 800 feet and upwards above Shuswap lake, very thick poplar, willow, small fir and jack pine, no timber value, slopes too steep for cultivation and too brushy for grazing. In the NW. $\frac{1}{4}$ sec. 30 there is about 30 acres of swamp land which would be suitable for farming.

SEC. 21, NE. $\frac{1}{4}$, E. $\frac{1}{2}$ NW. $\frac{1}{4}$; SEC. 22, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$; SEC. 28.—Steep slopes and rough rolling benches 1,100 feet and upwards above Shuswap lake, white clay loam, sandy and stony, scattered fir up to 18 inches, much underbrush in places, very small timber value, pine and bunch grass, fair grazing land, very dry and without water for irrigation, sec. 28 is held under grazing lease 2756.

SEC. 29, NE. $\frac{1}{4}$; SEC. 31, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 32, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Rough, rolling bench land 1,200 to 2,070 feet above Shuswap lake, light clay loam with much gravel and stone, scattered fir and bull pine to 1 foot diameter, with underbrush in places, small timber value, much pine grass with some bunch grass, fair grazing land. Some of benches might be suitable for farming, but they are very dry and cannot be irrigated. Land is held under grazing lease 2756. There is a narrow strip of land through centre sec. 32 in a deep ravine connecting the valley of Pillar lake and Blair Creek valley, which might be irrigated and would probably be suitable for farming.

Tp. 19, R. 12, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 5; SEC. 8.—Nearly all steep mountain slopes on east side of Pillar lake, also some very rough banks on west side of lake 1,725 feet and upwards above Shuswap lake, most of slopes very rocky, open, fir and bull pine to 18 inches diameter, lumber value, pine and bunch grass, of some value for grazing, the east half of both sections is badly broken by Pillar lake.

SEC. 6; SEC. 7; SEC. 18, SW. $\frac{1}{4}$.—Rolling bench land 1,370 to 2,070 feet above Shuswap lake, sandy clay loam with much stone and gravel in places, partially open, scattered fir up to 18 inches diameter in places with considerable underbrush, very small timber value, some benches are not too rough for farming, the best land lying in the N. $\frac{1}{2}$ sec. 7 and SW. $\frac{1}{4}$ sec. 18. In the NE. $\frac{1}{4}$ sec. 7 there is some low land, elevation is about 1,700 feet in the valley connecting Chase Creek valley with Pillar lake, about 25 acres, which could be irrigated, none of the rest could be irrigated, and is of doubtful agricultural value without, there is much pine grass with some bunch grass and would be fair grazing land.

SEC. 18, NE. $\frac{1}{4}$, SEC. 19, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Steep mountain slopes 1,480 to 2,600 feet above Shuswap lake, light clay loam, stony, small fir, pine, poplar and willow brush, no timber value, there is a narrow strip of land probably about 20 acres along Chase creek on the west side of NE. $\frac{1}{4}$ sec. 18 which might be of use for farming, the rest is all brushy and of very little value as grazing land.

SEC. 19, NW. $\frac{1}{4}$.—Rolling bench land 1,480 to 1,755 feet above Shuswap lake, light clay loam with a good deal of gravel, poplar, willow, alder, small fir and spruce, no

timber value, $\frac{1}{4}$ section is broken by Chase Creek valley, much of land appears moist, especially on south and would make good farm land, value about 40 per cent, there in much pine grass throughout the land, would be of some value for grazing.

SEC. 29, NW. $\frac{1}{4}$, SEC. 30, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land and steep slopes 1,500 to 2,000 feet above Shuswap lake, light clay loam with stone and gravel in places, scattered fir up to 1 foot diameter, possible timber value in NW. $\frac{1}{4}$ sec. 29, much small fir and jack pine in places, SE. $\frac{1}{4}$ sec. 30 and NW. $\frac{1}{4}$ sec. 29 are broken by ravine of Charcoal creek, in these quarters north of Charcoal creek and in the NW. $\frac{1}{4}$ sec. 30 there are some benches, covered with jack pine, which are nearly level. These could be irrigated from Charcoal creek if water rights are not all taken, and would make fair farm land; remainder of land of value for grazing.

SEC. 30, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$; SEC. 31, SW. $\frac{1}{4}$.—Rolling bench land 1,325 feet above Shuswap lake, light clay with stone and gravel in places, poplar, willow, birch, small fir, jack pine, etc., no timber value, $\frac{1}{4}$ sections are all broken by the deep ravine of Chase creek, SW. $\frac{1}{4}$ sec. 31 by mountain slopes in NW. corner, there is some very good land on the west side of Chase creek, but it is rather broken, on the east side there are some jack pine flats about 1,600 feet above Shuswap lake, which would probably be of value if water could be obtained from Charcoal creek, value as farm land about 25 per cent.

SEC. 31, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 32; SEC. 33, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, N. $\frac{1}{2}$ of SW. $\frac{1}{4}$.—Rough mountain slopes 1,500 to 2,800 feet above Shuswap lake, white sandy clay with some gravel, stony and rocky on ridges, much fir up to 1 foot diameter, jack pine and small fir underbrush in places, pine grass with some bunch grass, most of slopes are too rough for cultivation, but would make good grazing land, all slopes are very dry and without running water, on the west side of NE. $\frac{1}{4}$ sec. 31 there is a small area of good farm land along the bottom of Chase Creek valley about 1,300 feet above Shuswap lake, and in south side of NE. $\frac{1}{4}$ sec. 33 there are a few acres of fairly level land near Charcoal creek at an elevation of about 1,800 feet.

SEC. 33, S. $\frac{1}{2}$, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 34, SW. $\frac{1}{4}$; SEC. 35, NW. $\frac{1}{4}$.—Fairly steep mountain slopes 1,800 to 2,400 feet above Shuswap lake, sandy clay loam, very stony, thick willow, alder, poplar and jack pine, no timber value, of no value for agriculture or grazing.

SEC. 34, NE. $\frac{1}{4}$.—Fairly level land in bottom of Charcoal creek and broken in SE. by gradual slopes of mountain level land about 1,870 feet above Shuswap lake, black loam with clay subsoil, small spruce alder, poplar, birch, etc., some large spruce along creek, no timber value, good farm land, if not too high, most of good land lies in N. $\frac{1}{2}$ of $\frac{1}{4}$ and has been applied for by a squatter named Joseph Blane.

Tp. 20, R. 12, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 1; SEC. 2, SE. $\frac{1}{4}$.—Nearly all steep slopes 2,000 feet and upwards above Shuswap lake, sandy clay loam with much stone in places, thick willow, alder, poplar and jack pine with some large spruce along Charcoal creek, no timber value, most of land too high and rough for cultivation and too brushy for grazing, the only land is a narrow strip along Charcoal creek in NW. $\frac{1}{4}$ sec. 1 and SE. $\frac{1}{4}$ sec. 2.

SEC. 2, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$; SEC. 3, NE. $\frac{1}{4}$, N. $\frac{1}{2}$ SE. $\frac{1}{4}$.—Steep slopes facing south 2,000 feet and upwards above Shuswap lake, sandy clay, stony, a few large fir with much small fir, jack pine, poplar, willow and alder, no timber value, much pine grass, there is much brush, but land is of some value for grazing.

SEC. 3, S. $\frac{1}{2}$ SE. $\frac{1}{4}$.—Land nearly level lying in bottom of Charcoal Creek valley, 1,870 to 2,000 feet above Shuswap lake, some large fir with poplar, willow, etc., no timber value, sandy clay loam, good farm land if not too high, a squatter Joseph Blane has applied for an entry.

SEC. 3, SW. $\frac{1}{4}$; SEC. 4, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 5, S. $\frac{1}{2}$ SE. $\frac{1}{4}$.—All steep slopes facing north 1,900 to 3,000 feet above Shuswap lake, white sandy clay, stony with rock on upper ridges, much fir up to 1 foot diameter in places with scattered underbrush

probably a small timber value in S. $\frac{1}{2}$ sec. 4, much pine grass throughout with some bunch grass, all good grazing land, very dry and without water.

SEC. 5 SW. $\frac{1}{4}$.—Rolling slopes facing NW. 1,300 feet upwards above Shuswap lake, sandy clay with much gravel and stone, small fir, jack pine, spruce and cedar with scattered fir to 16 inches diameter, no timber value, too brushy for grazing and no use for agriculture.

SEC. 5 NW. $\frac{1}{4}$.—Somewhat rolling slopes facing west 1270 to 1800 feet above Shuswap lake, sandy clay with considerable gravel, small fir, jack pine, willow, etc., with scattered fir to 16 inches, no timber value, slopes on west side of $\frac{1}{4}$ section are gentle and would class about 25 per cent as farm land.

SEC. 6, SE. $\frac{1}{4}$.—Rolling slopes rising from Chase creek 1,200 to 1,600 feet above Shuswap lake, sandy clay loam with some gravel, small spruce, fir, poplar and willow with a few spruce and fir to 18 inches diameter, about half of $\frac{1}{4}$ section would class about 60 per cent farm land, and the remainder is of doubtful utility.

SEC. 6, W. $\frac{1}{2}$ NE. $\frac{1}{4}$; SEC. 7, W. $\frac{1}{2}$ SE. $\frac{1}{4}$, W. $\frac{1}{2}$ NE. $\frac{1}{4}$.—Steep mountain slopes facing east 1,200 feet and upwards above Shuswap lake, sandy clay, stony, young fir, poplar and willow brush, scattered fir up to 16 inches diameter, very doubtful timber value, too brushy for grazing.

SEC. 7, E. $\frac{1}{2}$ NE. $\frac{1}{4}$.—Level land lying in bottom of Chase Creek valley 1,150 to 1,200 feet above Chase creek, small fir, spruce, poplar and willow with some spruce and fir up to 18 inches diameter, very low timber value, sandy clay loam with some gravel, value as farm land 50 per cent.

SEC. 8, SW. $\frac{1}{4}$.—Rolling land broken on east side by mountain slopes 1,190 to 1,600 feet above Shuswap lake, sandy clay with much stone and gravel, jack pine, willow, small fir, etc., with scattered fir to 12 inches diameter, very doubtful timber value, probably about two-thirds of $\frac{1}{4}$ could be cultivated, value as farm land about 35 per cent.

NW. $\frac{1}{4}$.—Rolling slopes facing SE., 1,155 to about 1,700 feet above Shuswap lake, sandy clay with much stone and gravel, small fir, willow, etc., with scattered fir and bull pine to 16 inches diameter, timber value, of very doubtful agricultural value, a few acres of land along the west side might be some good.

SEC. 12.—Steep mountain slopes on west $\frac{1}{2}$ changing to rolling jack pine benches on the east, 2,000 feet and upwards above Shuswap lake, sandy clay loam with much stone, small jack pine, poplar and willow, no timber value, some benches on east might be of use for farming if not too high, they are also very dry and without apparent means of irrigation, too much brush for grazing.

SEC. 17, W. $\frac{1}{2}$.—Rather steep slopes 1,150 feet and upwards above Shuswap lake, sandy clay with much stone, scattered fir and spruce to 24 inches with much underbrush, doubtful timber value, some old brûlé to north, land is of very little value for farming and too brushy for grazing.

SEC. 18, E. $\frac{1}{2}$.—Level land lying in bottom of Chase Creek valley 1,050 to 1,200 feet above Shuswap lake, broken on the west side by steep slopes, sandy clay loam, scattered fir and spruce up to 24 inches diameter with much underbrush, very doubtful lumber value, about two-thirds would make good farm land, value about 50 per cent.

SEC. 19, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Chiefly bottom land lying along the bottom of Chase creek 990 to 1,200 feet above Shuswap lake, light clay loam, fir and spruce to 24 inches diameter with much underbrush, fair timber value, most of land is good farm land, value about 50 per cent, the NE. corner of NE. $\frac{1}{4}$ is broken by mountain slopes and also the SW. corner of SE. $\frac{1}{4}$.

SEC. 20, W. $\frac{1}{2}$.—Chiefly mountain slopes 1,150 feet and upwards above Shuswap lake, sandy clay, stony with rock outcrops, fir up to 16 inches diameter with much underbrush, timber value, there are some rolling slopes in SW. part SW. $\frac{1}{4}$, but it is doubtful if they are of any value for cultivation.

SEC. 30.—The greater part consists of steep mountain slopes 1,000 feet and upwards above Shuswap lake, through central part of section there is some nearly level

land 950 feet to 1,100 feet above Shuswap lake, light clay loam with some gravel, spruce and fir up to 24 inches diameter with much underbrush, lumber value, also lumber value on slopes, about $\frac{1}{2}$ of NW. $\frac{1}{4}$ and SW. $\frac{1}{4}$ and 5 and 10 chains along the west side of NE. $\frac{1}{4}$ and SE. $\frac{1}{4}$ would class 50 per cent farm land.

SEC. 31, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Nearly level land lying along bottom of Chase Creek valley, 880 to 1,100 feet above Shuswap lake, steep mountain slopes on both sides, spruce and fir up to 20 inches diameter, much underbrush consisting of small spruce, cedar, fir, jack pine, etc., small timber value; bottom land, light clay loam, $\frac{1}{2}$ SW. $\frac{1}{4}$, $\frac{1}{4}$ of SE. $\frac{1}{4}$ and about $\frac{1}{2}$ NE. $\frac{1}{4}$ would class about 50 per cent as farm land; the remainder is very brushy and very little use for grazing.

Tp. 21, R. 12, W. 6th Mer. *M. P. Bridgland, D.L.S., 1909.*

SEC. 6, W. $\frac{1}{2}$.—Steep slopes facing east 800 to 1,800 feet above Shuswap lake, light clay loam, stony and rocky in places, fir and bull pine to 16 inches diameter with much underbrush in places, fair timber value, pine grass where open, poor grazing land.

SEC. 6, E. $\frac{1}{2}$.—Chiefly steep slopes 800 to 1,150 feet above Shuswap lake, light clay loam, stony on hillsides, scattered fir and bull pine to 16 inches diameter with much underbrush, small lumber value, there is a narrow strip of good farm land about 10 chains wide along Chase creek.

SEC. 7, W. $\frac{1}{2}$.—Slopes facing east 750 to 1,200 feet above Shuswap lake, yellow sandy clay loam, stony in places and very dry, fir and bull pine to 18 inches diameter, brushy in places, fair lumber value, much pine grass throughout, of some value for grazing. On the east side along creek there is a strip of good farm land 10 to 15 chains wide, NW. $\frac{1}{4}$ is included in grazing lease 3319.

SEC. 7, SE. $\frac{1}{4}$.—Gradual slopes facing west 760 to 1,150 feet above Shuswap lake, light clay loam, stony in places, scattered fir with much underbrush consisting of small fir, cedar, willow, etc., no timber value, some good agricultural land along west side.

NE. $\frac{1}{4}$.—Steep slopes facing east 760 to 1,380 feet above Shuswap lake, light clay loam, very stony with rock outcrops to east, partially open with fir and bull pine to 16 inches diameter, fair timber value, very doubtful agricultural value, fair grazing land, included in grazing lease 3319.

SEC. 8, S. $\frac{1}{2}$ NW. $\frac{1}{4}$.—Rolling bench land 1,100 to about 1,250 feet above Shuswap lake, light clay loam, small fir and jack pine with some alder and poplar, scattered large fir, small timber value, some of land would probably be suitable for farming.

SEC. 13, NE. $\frac{1}{4}$.—Rolling land broken by steep mountain slopes on west side, fir up to 2 feet diameter with much windfall, small fir, cedar, etc., fair timber value east half of $\frac{1}{4}$ section gentle slopes, 740 to 950 feet above Shuswap lake, light clay loam, value as fruit land about 50 per cent.

SEC. 16, NE. $\frac{1}{4}$.—Rolling bench land broken in SE. by mountain slopes, bench land 1,230 to 1,500 feet above Shuswap lake, sandy clay with some gravel, stony near mountain, fir and pine to 10 inches diameter, much underbrush, small timber value, of doubtful agricultural value.

SEC. 17, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land 850 to 1,450 feet above Shuswap lake, steep slopes in NW. corner of NW. $\frac{1}{4}$ most of land 1100 to 1450 feet above lake, light clay loam with some gravel, stony in places with a few rock outcrops, scattered fir and bull pine up to 18 inches diameter, timber value on west side, land is all dry and with no apparent means of irrigation, value as farm land NE. $\frac{1}{4}$ 60 per cent, SW. $\frac{1}{4}$ 50 per cent, NW. $\frac{1}{4}$ 25 per cent.

SEC. 18, E. $\frac{1}{2}$.—Bench land 680 to 780 feet above Shuswap lake, broken on the east by steep slopes rising to 1,375 feet above lake, white clay loam, fir up to 18 inches diameter with much underbrush, small timber value considerable land along the west side might be of value for fruit or farming, W. $\frac{1}{2}$ SE. $\frac{1}{4}$ would class about 60 per cent

and NE. $\frac{1}{4}$ about 40 per cent, some of land is open and of value for grazing, it is included in grazing lease 3319.

W. $\frac{1}{2}$.—Some nearly level land on east side in valley of Chase creek, 680 to 780 feet above Shuswap lake, with steep slopes on west side rising to an elevation of 1200 feet, clay loam on flats with a white sandy clay on hillside, stony in places, scattered fir and bull pine up to 2 feet diameter, fair lumber value, pine grass and bunch grass on hillside, good grazing, value of E $\frac{1}{2}$ of both $\frac{1}{4}$ sections as fruit land about 45 per cent, all is included in grazing lease 3319.

SEC. 19, SW. $\frac{1}{4}$.—Rather rough slopes and small benches facing east 600 to 1,185 feet above Shuswap lake, sandy clay with a good deal of stone, scattered fir and bull pine to 2 feet diameter with underbrush in places, fair timber value, of no value for agriculture, but fair grazing land.

SEC. 20, S. $\frac{1}{2}$ SW. $\frac{1}{4}$, S. $\frac{1}{2}$ SE. $\frac{1}{4}$; SEC. 21, S. $\frac{1}{2}$ SW. $\frac{1}{4}$.—Nearly all steep slopes facing north 750 to 1,685 feet above Shuswap lake, light clay loam with much stone and gravel, much small fir and jack pine, a few large fir, small timber value, no value for agriculture and too brushy for grazing.

SEC. 20, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 21, N. $\frac{1}{2}$ of NW. $\frac{1}{4}$.—Steep slopes facing south 710 to 1,320 feet above Shuswap lake, light clay loam with much stone and rock, scattered fir and bull pine to 2 feet diameter, small timber value, mostly open with pine and bunch grass, most of land too rough and probably too dry for cultivation, fair grazing land, all included in grazing lease 3354.

SEC. 21, SE. $\frac{1}{4}$.—Steep slopes 720 to 1,430 feet above Shuswap lake, sandy clay with some stone and gravel, fir and pine up to 10 inches diameter with much underbrush, very small timber value, land is of very doubtful agricultural value and too brushy for grazing.

SEC. 22, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough mountain slopes 900 feet and upwards above Shuswap lake, sandy clay, stony and rocky, scattered fir up to 18 inches diameter, with much young fir, jack pine, etc., very small timber value, of no value for cultivation or grazing.

SEC. 24, SW. $\frac{1}{4}$, S. $\frac{1}{2}$ NW. $\frac{1}{4}$.—Nearly all steep rough mountain slopes, fir up to 1 foot diameter with much underbrush, small timber value, no agricultural value, there is a very small area of good farm land along the east side.

N. $\frac{1}{2}$ NE. $\frac{1}{4}$.—Nearly level land 710 feet above Shuswap lake, broken on the east by steep rocky cliffs, light clay loam, stony, very rocky on east half, scattered fir and bull pine to 2 feet diameter with much underbrush, timber value, west half would class about 40 per cent farm land and east half might be some use for grazing.

SEC. 25, E. $\frac{1}{2}$.—Bench land on the west side from 710 to 1,000 feet above Shuswap lake, broken on the east by steep rocky slopes, clay loam, stony in places, scattered fir and bull pine to 18 inches diameter, fair lumber value, especially in NE. $\frac{1}{4}$, W. $\frac{1}{2}$ SE. $\frac{1}{4}$ would class about 50 per cent for fruit, benches in NE. $\frac{1}{4}$ are probably too dry for farming, there is considerable bunch grass and all of land would be of use for grazing, it is included in grazing lease 3319.

NW. $\frac{1}{4}$, N. $\frac{1}{2}$ SW. $\frac{1}{4}$.—Almost level land 730 to 750 feet above Shuswap lake and rising to a bench 950 feet high in the NE. corner, light clay loam with stone and gravel in places, fir with some spruce and cedar to 2 feet diameter, fair timber value, value as fruit land about 40 per cent, land has been formerly homesteaded and abandoned.

SEC. 26, S. $\frac{1}{2}$.—Easy slopes leading back to the mountain 800 to 1,120 feet above Shuswap lake, sandy clay with much gravel and stone, many large boulders throughout, fir and pine to 16 inches diameter with much underbrush, small timber value, the SE. $\frac{1}{4}$ is of very doubtful agricultural value and the SW. $\frac{1}{4}$ is too rough and rocky to be of any use for cultivation.

SEC. 27, FRAC. NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, L.S. 3 IN SW. $\frac{1}{4}$.—Rough rocky slopes from 650 to 1,200 feet above Shuswap lake, sandy clay with much stone and rock, scattered fir up to 14 inches diameter, very small timber value, of very little use for agriculture or

grazing, there are some small swamps near Trail Creek lake, but it is doubtful if they are of any use.

SEC. 27, NW. $\frac{1}{4}$; SEC. 28, ALL EXCEPT L.S. 1; SEC. 29; SEC. 30.—Rough rocky land consisting of steep slopes and benches 650 to 2,300 feet above Shuswap lake, sandy clay with much stone and many rock outcrops, fir and bull pine to 18 inches diameter with considerable underbrush, of small timber value, much pine grass and some bunch grass, some fair grazing land in south side, but most of it very poor, NW. $\frac{1}{4}$, sec. 27, Frac. SE. $\frac{1}{4}$, sec. 28, and S. $\frac{1}{2}$ sec. 30 are included in grazing lease 3354.

SEC. 34, E. $\frac{1}{2}$.—Rolling bench land facing east 620 to 1,020 feet above Shuswap lake, sandy clay, much of it stony, scattered fir up to 1 foot diameter, much small fir, poplar and willow, very small timber value, slopes very dry with pine grass where open, of very doubtful agricultural value and very poor grazing land, some of the lower slopes on the east side might be of use for growing fruit.

SEC. 35, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling land 620 to 825 feet above Shuswap lake, the NE. $\frac{1}{4}$ being broken on the north by steep rocky slopes, sandy clay loam, swampy in some places, fir up to 2 feet diameter with much underbrush, good timber value, in timber berth 437, nearly all of land is suitable for fruit or farming, and where swampy could be drained for fruit land, all land except the rocky slopes in north of NE. $\frac{1}{4}$ would class about 65 per cent as fruit land.

SEC. 36, SW. $\frac{1}{4}$; S. $\frac{1}{2}$, NW. $\frac{1}{4}$.—Rolling bench land 750 to 965 feet above Shuswap lake, white sandy clay loam, stony in places, fir up to 18 inches diameter with much small fir, fair lumber value, value as fruit land about 50 per cent, partially open with much pine grass, fair grazing land.

E. $\frac{1}{2}$; N. $\frac{1}{2}$ NW. $\frac{1}{4}$.—Steep slopes 850 feet and upwards above Shuswap lake, white sandy clay, very stony, rock outcrops in places, fir and bull pine 6 to 18 inches diameter, fair lumber value, much pine grass with some bunch grass, of some value for grazing land.

Tp. 22, R. 12, W. 6th Mer. *J. E. Ross, D.L.S., 1909.*

The land surveyed here consists of the quarter sections adjoining the Little Shuswap Indian Reserve No. 2 and Shuswap channel, but except in section 10 there is no land worth taking up. The land in this section lies about 1,000 feet above Little Shuswap lake, and can be reached by a rough road from Squilax siding, 2 miles distant, on the Canadian Pacific railway. There is good water in Chum creek, which flows in a ravine 200 feet deep. The land is fairly well wooded with pine and fir. The soil, a sandy loam, would be good for raising crops or produce, but irrigation would probably be necessary.

M. P. Bridgland, D.L.S., 1909.—SOUTH OF C.P.R., SEC. 2, E. $\frac{1}{2}$; SEC. 3; FRAC. SECS. 4, 5 AND 10, PART NOT IN INDIAN RESERVES.—Nearly all steep mountain slopes 50 feet and upwards above Shuswap lake, sandy clay loam, very stony and rocky, thick undergrowth of small cedar, fir, birch and willow with scattered fir and spruce to 20 inches diameter, very small timber value, sec. 3 is included in timber berth 497, along the north side of sec. 3 and south side of sec. 10 there is a bench about 15 to 20 chains wide about 790 to 850 feet above Shuswap lake, light clay loam, rather stony, this might be of use for farming, probable value about 20 per cent. Chum creek flows through the east part of this area.

R. D. McCaw, D.L.S., 1909.—SEC. 6 (FRAC.); SEC. 7 (FRAC.)—Steep slopes rising about 900 feet above Little Shuswap lake, stony loam soil, much open with scattering scrubby fir and bull pine, fair grazing land.

SEC. 17, NW. $\frac{1}{4}$ (FRAC.); SEC. 18 (FRAC.).—Rolling slopes, in places very rough, altitude 430 to 850 feet above Little Shuswap lake, light sandy soil with a good deal of stone in places, timber consists of fir and bull pine to 36 inches diameter, usually scrubby, much timber has been cut off and that of an inferior quality remains, 10 to 50 per cent value as fruit land, irrigation is needed and might be supplied from a lake in sec. 13, township 22, range 13.

SEC. 20, NE. $\frac{1}{4}$ (FRAC.), SE. $\frac{1}{4}$ (FRAC.); SEC. 21, NE. $\frac{1}{4}$ (FRAC.)—Rolling slopes, broken in places, rising from 210 to 655 feet above Little Shuswap lake, sandy loam soil, often stony, rock appears in a few places, much of valuable timber has been cut off and only scrubby fir and bull pine remain, some of which is of possible value, soil is adapted for fruit growing, value from 1 to 50 per cent, irrigation is needed and will be very difficult to obtain.

SEC. 20, NW. $\frac{1}{4}$.—Rolling slopes in SE. part, rising in steep slopes to NW., 400 to over 1000 feet above Little Shuswap lake, soil sandy loam, stony with rock outcrops in NW. part, scattering fir and bull pine to 24 inches, much has been cut off but what remains has probable value, S.E. part 20 per cent fruit land, needing irrigation which will be difficult to obtain.

SW. $\frac{1}{4}$.—Rolling slopes broken in places, rising in steep slopes in NW. part, 365 to 900 feet above Little Shuswap lake, sandy loam soil, stony, scattering fir and bull pine generally scrubby, much of timber has been cut off but remaining trees have possible value, S.E. part 20 to 50 per cent fruit land, needing irrigation which is difficult to obtain.

A. G. Wheeler, D.L.S., 1909.—SEC. 25, NE. $\frac{1}{4}$ FRAC.—Bench land, gradual slope from Shuswap lake to 500 feet, soil, sandy loam, rather stony, scattered Douglas fir and bull pine to 18 inches diameter, small stream flows through L.S. 16. Some cedar to 18 inches diameter along banks of creek, clumps of poplar and willow scrub, but mostly open with fair grazing. Much of best timber has been cut, remainder fair lumber value, from 50 to 70 per cent value as fruit land. In timber berth 263. O. Freeman, squatter, south part of NE. $\frac{1}{4}$.

SEC. 25, NW. $\frac{1}{4}$ FRAC.—Bench land, gradual slopes from Shuswap lake to 550 feet, badly broken in places, soil sandy loam, very stony on slopes, scattered Douglas fir and bull pine to 24 inches, has been lumbered, timber left only of fair value, small pine, fir and willow scrub. South part 60 per cent fruit land, north part 35 to 50 per cent fruit land. In timber berth 263.

SW. $\frac{1}{4}$ FRAC.—Bottom land, soil sandy loam with black loam in places, small poplar, birch, willow, alder, maple and cottonwood. Well watered and easily irrigated if necessary from channel of Adams creek, 70 per cent fruit land value. In timber berth 263.

SEC. 26, NW. $\frac{1}{4}$.—Bench land, rising from Adams creek to about 600 feet, north half badly broken, steep slopes with rock outcrops, scattered fir and bull pine, no lumber value, soil sandy loam. The south half is better adapted for cultivation, slopes gradual, scattered bull pine to 30 inches, of no lumber value, small fir, birch, cottonwood and willow along south, soil sandy loam, rather stony channel of Adams creek flows through south part, 50 to 70 per cent fruit land, in timber berth 263.

S. $\frac{1}{2}$.—Bottom land, soil sandy loam, with dark loam in places, stony, with much gravel in places, a few scattered fir to 20 inches in thick willow, birch and cottonwood scrub, of no lumber value, broken by numerous channels of Adams creek, value as fruit land 70 per cent, in timber berth 263.

SEC. 27, NW. $\frac{1}{4}$.—North half, bench land rising to about 600 feet above Adams creek. Slopes rather steep and broken, soil sandy clay loam, stony, scattered bull pine and fir to 18 inches, no lumber value, value as fruit land 30 per cent, L.S. 11 is bottom land, sandy loam, scattered fir to 30 inches, of no lumber value. Fruit land 60 per cent. L.S. 12 contains about 20 acres of workable land, fruit land value 60 per cent. Remainder of L.S. 12 steep slopes with thickly scattered Douglas fir and bull pine of lumber value, in timber berth 263.

NE. $\frac{1}{4}$.—Bench land, about 500 feet above Adams creek, gradual slope to north, soil sandy loam, rocky in places, scattered fir and bull pine to 30 inches, fair lumber value, clumps of poplar and willow brush, open places with fair grazing. Value as fruit land 35 per cent to 60 per cent, in timber berth 263.

FRAC. S. $\frac{1}{2}$.—Bottom land, bordering along Adams creek, soil sandy loam, stony and gravelly in places. Broken by channels of Adams creek, a few scattered fir and

spruce to 18 inches, of fair lumber value, thick small poplar, willow, birch, alder, maple and cottonwood. Value as fruit land 70 per cent, in timber berth 263.

R. D. McCaw, D.L.S., 1909.—SEC. 28, NE. $\frac{1}{4}$ (FRAC. EAST OF RIVER).—Rough slopes rising from Adams river to 600 feet, generally badly broken and useless for cultivation, rock outcrops, soil sandy loam, very stony, scattered fir and bull pine to 30 inches, fair lumber value, fair grazing, a strip from 3 to 10 chains wide along the river, of level land, soil light clay, liable to flood, thick cedar and willow scrub, scattered spruce, fir and cottonwood of fair lumber value, 50 per cent fruit land, in timber berth 263, west of river soil and growth is similar with small bench in SW. corner 400 feet above the river.

SE. $\frac{1}{4}$ (FRAC.)—Steep slopes rise from Adams river to top of small bench in west part, altitude of bench about 400 feet above the river, soil sandy loam, fir and bull pine to 24 inches of fair value, 50 per cent fruit land, irrigation needed, in timber berth 263.

SW. $\frac{1}{4}$ (FRAC.)—Gentle slope rising towards NW., 180 to 665 feet above Adams river, soil sandy and clay loam with clay subsoil, stony, fir and bull pine to 30 inches and small scrub in places, much timber has been logged but some of good quality remains, 50 per cent fruit land, irrigation is likely needed, possible but difficult, source Hiuihill creek, in timber berth 263.

NW. $\frac{1}{4}$.—Steep broken slope along Adams river with gentle slope reaching west and running into steep rocky slope in west part, 0 to 665 feet above Adams river, soil clay and sandy loam, stony in places, bull pine and fir to 30 inches diameter, good timber, much scrub in places, 50 per cent fruit land, irrigation possibly may be obtained from Hiuihill creek.

SEC. 29, SE. $\frac{1}{4}$.—Land rises in gentle rolling slope from SE. corner, rises in steep broken rocky slope in NW., 180 to 1000 feet above Adams river, soil sandy loam and clay loam, stony, with stony clay subsoil, fir and bull pine to 30 inches, much of timber has been cut but some of value remains, poplar and jack pine, much scrub in places, lower part is 50 per cent fruit land, in timber berth 263.

NE. $\frac{1}{4}$.—Rather rough slopes rocky in NE. corner, 500 to 1000 feet above Adams river, soil sandy and clay loam, stony and gravelly usually, a few fir and bull pine to 20 inches diameter with small fir, poplar, birch and jack pine, some of timber is small value, east part 25 per cent fruit land, irrigation possibly obtained from Hiuihill creek, in timber berth 263.

R. D. McCaw, D.L.S., 1909.—SEC. 30, NW. $\frac{1}{4}$.—Rather rough land rising from Hiuihill creek, 500 to 1,200 feet above Adams river, soil clay and sandy loam, gravelly and rocky in places, fir, spruce, jack pine and cedar occasionally to 24 inches diameter, much small growth, small timber value, NW. part 25 per cent fruit land, irrigation may be obtained from creek above.

NE. $\frac{1}{4}$.—Much broken slopes fairly well wooded with small fir, cedar, poplar, birch and jack pine, some bull pine, timber value only, In timber berth 263.

SEC. 31, SE. $\frac{1}{4}$.—Rough irregular slopes rising from Hiuihill creek, 580 to 1,100 feet above Adams river, soil sandy and clay loam, stony in parts, scattered fir to 24 inches and a few cedar around the creek, much small scrub, no agricultural value, small timber value. In timber berth 263.

SW. $\frac{1}{4}$.—Irregular in parts with much workable land, a low flat exists along the south boundary, 500 to 760 feet above Adams river, soil clay and sandy loam, stony and rocky in parts, fir to 24 inches in diameter scattered through smaller jack pine, bull pine, poplar and small scrub, a few cedar in south part, 50 per cent fruit land, in timber berth 263, irrigation if necessary may be obtained from Hiuihill creek.

NW. $\frac{1}{4}$.—High rocky hill in NW. part with workable slopes falling therefrom toward Hiuihill creek, 580 to 1,140 feet above Adams river, soil clay and sandy loam often stony and sometimes rocky, small growth of fir, jack pine, poplar, with scattered fir to 24 inches diameter, 50 per cent fruit land, irrigation may be obtained from creek above. In timber berth 263.

NE. $\frac{1}{4}$.—Rising land with succession of benches, much workable, 75 to 580 feet above Adams river, soil clay and sandy loam, stony and rocky in places, broken by rocky ravine of Hiuihill creek, small jack pine, fir, birch and poplar, with some fir to 24 inches, 50 per cent fruit value, irrigation may be obtained from creek above. In timber berth 263.

SEC. 32, NW. $\frac{1}{4}$.—Slopes on west side of river rising towards southwest with a few benches in succession, generally very much broken but a good deal workable, soil sandy and clay loam with much rock in places, and stone along the river, fir and cedar to 24 inches, with much scrub, fir is scattered over all with small poplar, bull pine, jack pine and birch, east of river is bench land rising to 340 feet above river, sand and sandy loam, lower parts of which are liable to flood, thick scrub with a few fair-sized trees, 25 to 40 per cent fruit land, irrigation from Adams river and Hiuihill creek.

SEC. 32, SW. $\frac{1}{4}$.—Generally rough broken slope rising to SW., 380 to 1,100 feet above Adams river, soil sandy and clay loam with much rock and stone, old burn in parts with some scattering fir to 20 inches in small scrub, also some jack pine and cedar of small dimensions, low timber value. In timber berth 263.

NE. $\frac{1}{4}$.—On each side of river steep slopes rise which are rocky and useless for cultivation, on east side a narrow strip of flat along river exists of about 25 per cent fruit value, sandy loam and sand usually very rocky and stony, some fir and bull pine to 30 inches, with smaller growth of poplar, jack pine and birch in places, scant grazing on east side of river. In timber berth 263.

SE. $\frac{1}{4}$.—Generally rough, broken slopes with a fair amount of workable land, altitude rises to 830 feet above the Adams river, soil sandy and clay loam with a good many outcrops in places scattered fir to 20 inches in young jack pine, poplar, birch and small scrub, SE. part has value as fruit land of about 40 per cent, irrigation may be obtained from Hiuihill creek.

SEC. 33 (WHOLE SEC.)—East of river steep slopes rise from small flats in SW. $\frac{1}{4}$, often rocky, sandy, in parts useless for cultivation, scattering bull pine and fir to 36 inches, of good value, scant grazings, in SW. $\frac{1}{4}$ west of river steep slope rises to SW. with small area of sloping bench land in SW. corner, 30 per cent fruit land, fair growth of fir and small jack pine, poplar and birch. In timber berth 263.

A. O. Wheeler, D.L.S., 1909.—SEC. 34, W. $\frac{1}{2}$.—Rough and broken bench land rising to 1,000 feet above Adams creek, soil sandy loam, very stony, many rock outcrops, scattered fir and bull pine to 30 inches of fair lumber value, poplar and willow brush with fair grazing in places, of no agricultural value. In timber berth 263.

NE. $\frac{1}{4}$ AND N. $\frac{1}{2}$ OF SE. $\frac{1}{4}$.—Rolling bench land rising to about 1,000 feet above Adams creek, very stony with rock outcrops, soil sandy loam, scattered fir and bull pine to 15 inches of fair lumber value, maple, willow and birch scrub, no agricultural value. In timber berth 263.

SEC. 34, S. $\frac{1}{2}$ OF SE. $\frac{1}{4}$.—Bench land about 700 feet above Adams creek, gradual slope, sandy loam, rather stony, small fir and jack pine of no lumber value, could be cultivated, value as fruit land 35 per cent.

SEC. 35, N. $\frac{1}{2}$.—Steep, rough slopes rising to about 1,200 feet above Adams creek, broken, rock outcrops, soil sandy loam, very stony, Douglas fir to 2 feet diameter, thick birch, maple and willow scrub, of fair timber value, of no agricultural value. In timber berth 263.

S. $\frac{1}{2}$.—Gradual slopes from about 150 to 700 feet above Adams creek, soil sandy loam, very stony, scattered fir and bull pine to 20 inches, of fair lumber value, small poplar, birch and willow, fair grazing, mostly workable, from 15 to 30 per cent fruit land. In timber berth 263.

SEC. 36, N. $\frac{1}{2}$.—Steep slopes, from about 500 to 1,200 feet above lake, rough and broken, soil sandy loam, very stony, thickly scattered Douglas fir and bull pine to 20 inches of lumber value, small fir, poplar, and willow brush, no agricultural value. In timber berth 263.

SW. $\frac{1}{4}$.—About 40 acres (L.S.4) of possible fruit land, gradual slopes, soil sandy

loam, stony, scattered Douglas fir and bull pine to 18 inches of fair value; remainder of quarter is steep and badly broken with scattered fir and bull pine, of lumber value and fair grazing. In timber berth 263.

SE. $\frac{1}{4}$.—L.S. 1, workable slopes about 350 feet above Shuswap lake, soil sandy loam, rather stony, scattered fir and bull pine to 18 inches, fair lumber value, small poplar, willow, birch, etc., small stream flows through west half, value as fruit land 30 per cent; remainder of quarter, steep and broken slopes, soil, sandy loam, very stony, scattered fir and bull pine to 18 inches of lumber value, fair grazing in places. In timber berth 263.

Tps. 22 and 23, R. 12, W. 6th Mer. *J. E. Ross, D.L.S., 1909.*

The land surveyed in these townships lies to the west of Adams river, a turbulent stream, averaging 4 chains in width and 4 feet in depth, with a current of about 6 miles per hour; it flows from the southern extremity of Adams lake into Shuswap lake. The river is full of rapids and riffles, and, in its course of 8 miles, falls nearly 200 feet. At the north end of Adams river, near Adams lake, the Adams River Lumber Company has built a dam across the river, and the intention is to open the flood gates when wishing to utilize the river for log driving. In the southwest quarter of section 33, township 22, range 12, the river runs through a narrow canyon half a chain in width. This canyon is well suited for the economical development of power. The land along Adams river is mostly hilly and rocky and not worth taking up. A very good wagon road follows an easy grade from the north shore of Little Shuswap lake to Adams lake. In the northwest quarter of section 32, township 22, range 12, a large creek enters Adams river from the southwest, and I surveyed part of the valley of this creek, along which there is a flat 40 to 60 chains in width. The elevation averages 1,800 feet above sea-level. In this valley there are some good small groves of cedar, while the hills on either side are wooded with fir and black pine. There are several small meadows, the largest being one of 40 acres, in the northwest quarter of section 34, township 22, range 13. Parts of the flat are covered with a growth of young cottonwood and spruce, which would be easily cleared. Ample water for settlers can be obtained from the main creek or from several small tributaries, and, as the soil is a fairly rich sandy loam, the valley should be well suited to general farming and fruit growing. At present there is a rough horse trail leading to the valley from the Adams lake wagon road, and a wagon road could be constructed at moderate cost following approximately along the route of the present trail. The grade would not be excessive. We saw some deer in this valley and signs of bear; grouse were plentiful. The coyotes, so numerous in other parts of the district, do not seem to have invaded this valley yet. The valley is not in the Dry Belt, and there is evidently a fair precipitation, as the snow had barely gone by May 1. Irrigation would not be necessary. The valley beyond the ground covered by the survey is well timbered with cedar. Two creeks enter the valley from the southwest, joining near the middle of the north boundary of section 23, township 22, range 13. There are several old beaver dams along the creeks. In section 31, township 22, range 12, the creek makes a rapid descent of 400 feet. It has an average depth of 12 inches and is 15 links wide. A fair amount of power could be developed from it. The land surveyed along the east shore of Adams lake is hilly from the water's edge, but in the southwest quarter of section 19, township 23, range 12, and the southwest quarter of section 24, township 23, range 13, there is a little land that might be adapted to fruit culture.

TP. 23, R. 12, W. 6th Mer. *R. D. McCaw, D.L.S., 1909.*

SEC. 5, SE. $\frac{1}{4}$.—Bench land in SW. part rising in precipitous rock slopes in NE. part, altitude of bench land rises to 340 feet above Adams river, soil, sandy clay and clay loam, stony, cedar birch and fir to 20 inches scattered throughout with much scrub, fair value as timber land, 50 to 75 per cent fruit land, irrigation if needed may be obtained from Nikwikwaia creek. In timber berth 263.

NE. $\frac{1}{4}$.—Level bench land 350 feet above Adams river in west part with steep rocky slopes rising to the east, soil sandy loam, stony and rocky in places, scattering fir and bull pine to 20 inches diameter, small cedar, birch, willow and maple scrub in places, 50 per cent fruit land value, if needing irrigation it may be obtained from Nikwikwaia creek. In timber berth 263.

NW. $\frac{1}{4}$.—Bench land slightly rolling, rising to 350 feet above Adams river, quarter is broken by that river, soil sandy and clay loam, stony in places, small birch, poplar, willow with some bull pine and fir to 30 inches of good quality, a few small cedar in places, 50 to 75 per cent fruit land, irrigation if necessary easily obtained. In timber berth 263.

SEC. 5, SW. $\frac{1}{4}$.—Broken by Adams river, has bench land on each side, rising in rather rough slopes on SW. corner, altitude rises to 625 feet above the river, soil sandy and clay loam, stony in places and also rocky, growth consists of fir and bull pine of fair size scattered in small jack pine, poplar and birch, much undergrowth in places, 50 to 75 per cent fruit land, irrigation easily obtained from Hiuihill and Nikwikwaia creeks. In timber berth 263.

SEC. 6, SE. $\frac{1}{4}$.—Much bench land with some workable slopes, 140 to 720 feet above Adams river, soil sandy and clay loam often stony, a few rocky slopes in places, generally small growth of fir, poplar, birch and jack pine with a few large trees, timber value is rather low, 50 per cent fruit land, irrigation not likely needed. In timber berth 263.

SW. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Much swampy land which can easily be drained, slopes rise in west part, 750 to 900 feet above Adams river, soil sandy and clay loam, stony and rocky in places some fir to 24 inches and a few spruce, smaller birch, cedar, hemlock and poplar, also much scrub in parts, 25 per cent fruit land, irrigation not likely needed. In timber berth 263.

NW. $\frac{1}{4}$.—Generally rough broken slopes having poor value, much rock, some fir and bull pine to 24 inches, much small scrub and fir, cedar, jack pine, birch and poplar averaging 6 inches, small timber value. In timber berth 263.

NE. $\frac{1}{4}$.—Sloping land rising from river with benches of fair area, altitude rises to 750 feet above Adams river, timber consists of poplar, fir, cedar, birch and jack pine to 10 inches, with some fir of large dimensions rather poor lumber value, 25 to 50 per cent fruit land, irrigation not likely needed. In timber berth 263.

SEC. 7 (FRAC.).—Bench land along Adams lake with steep slopes rising in SW. altitude rises to 780 feet above the lake, soil sandy and clay loam, often stony, growth of valuable timber is very small, generally small fir, poplar, birch, bull pine, cedar to 10 inches with scrub and windfall, a few larger trees exist, 25 to 75 per cent fruit land except SW. part of SW. $\frac{1}{4}$ which has very little agricultural value, irrigation is not likely necessary, F. H. Sturgill is squatted on east half of SW. $\frac{1}{4}$ and fractional west half of SE. $\frac{1}{4}$, no valuable timber on this area. In timber berth 263.

SEC. 8, S. $\frac{1}{2}$ (FRAC.).—A small area of bench land but generally rocky slopes falling to Nikwikwaia creek, bench is 350 feet above Adams river, soil sandy loam, stony, cedar, bull pine, fir, poplar, birch and much underscrub, some of timber is fair quality, bench is 50 per cent fruit land. In timber berth 263.

A. O. Wheeler, D.L.S., 1909.—PARTS SECS. 18 AND 19.—A strip along the lake of from 10 to 15 chains width would include all possible agricultural land has been classed as fruit land of 30 per cent to 50 per cent value, above are steep slopes with grassy opens and scattered patches of timber suitable for grazing purposes, timber, small fir, birch, cedar, poplar and willow with scattered fir and bull pine to 24 inches and 18 inches diameter, respectively, of lumber value; soil brown sandy loam with stones and gravel, on steep slopes, whitish clayey loam very stony and gravelly, with rock showing in places.

Tp. 25, R. 12, W. 6th Mer. E. W. Robinson, D.L.S., 1909.

This township is best reached in summer from Chase, on the main line of the Canadian Pacific railway, thence to the Adams' River Lumber Company's tug on

Little Shuswap lake to the warehouse at the northerly point of this lake. From here an excellent wagon road starts, following the valley of Adams river to the "dam camp" at the south end of Adams lake, a distance of about 9 miles. The company have a steamboat on Adams lake giving direct access to this township, which lies on both sides of the lake. During the winter months, if the ice on Little Shuswap lake is unfit for travelling the best route is from Squilax, on the main line of the Canadian Pacific Railway thence across Shuswap Channel by canoe or scow to the Indian reserve on the north side. An excellent wagon road then crosses the reserve, connecting with the wagon road along Adams river. The northern portion of the township east of Adams lake has been fire-swept, a few isolated patches of hemlock, fir, cedar and pine up to 24 inches having escaped. Second growth hemlock, fir, cedar and birch is now growing up. The land is all hillside, there being no bottom land at all along Adams lake and no hay meadows exist. Several small benches occur, the largest being in the south-east quarter of section 23 and the southwest quarter of section 24. The soil is a light sandy loam, with considerable surface rock on the steeper slopes. The country is well adapted for mixed farming and the hardier varieties of fruit could be raised successfully. Several small creeks of excellent water were found and irrigation, if necessary, would be comparatively easy. The only market at present for produce would be the lumber camps on Adams lake, the distance from the railway being too great for profitable shipping. No water-powers exist and no minerals of economic value were seen. Caribou, deer, black bears, lynx, marten and the smaller fur-bearing animals are fairly numerous. Adams lake is well stocked with rainbow, grey and Dolly Varden trout, char and a few other varieties of fish.

A. O. Wheeler, D.L.S., 1909.—SEC. 14; PART SEC. 13.—Rising back to SE. in fairly easy general slopes from Adams lake, up to 800 feet above lake may be classified as fruit lands, there to 1,200 feet as farm lands; beyond are timbered and steeper slopes to crest of highlands. In many places the slopes are steep and stony and the land is broken. Soil generally sandy loam (brown and yellow) with more or less gravel and stone throughout. Fruit lands vary from 10 to 50 per cent in value. Timber, a thick growth of small fir, jack pine, birch, cedar, poplar and cottonwood with thick undergrowth scattered fir to 20 inches diameter, white pine to 18 inches and cedar to 15 inches are met with in NW. $\frac{1}{4}$ sec. 14, of good lumber value. In vicinity of lake, timber has been recently scorched by fire.

FRAC. SEC. 15, S $\frac{1}{2}$.—SW. $\frac{1}{4}$ is broken by deep valley of mountain torrent, on south side slopes rise to 500 feet above lake, 30 to 45 per cent value. On north side is an elevated plateau 350 to 650 feet above Adams lake. Soil, yellow and brown sandy loam, stony throughout—may be classed as fruit land of 40 to 50 per cent value. Timber, second growth fir, pine and cedar, cedar to 15 inches along torrent, no timber of lumber value.

N. $\frac{1}{2}$.—General slopes to 800 feet above Adams lake, a portion of the plateau in the S. $\frac{1}{2}$ extends into the NW. $\frac{1}{4}$. Soil, brown sandy loam with more or less stone and gravel may be classed as fruit land of 25 to 50 per cent value. Timber, second growth and larger timber, fir, jack pine, cedar, birch, poplar and cottonwood with thick undergrowth of cedar and hemlock. Throughout are scattered fir to 20 inches, cedar to 15 inches and occasional white pine to 18 inches, of good lumber value in places, belt of fire scorched timber around lake.

PART SEC. 23.—Sloping easily back to 500 feet above lake, rolling land with some nearly level benches broken in parts; soil clayey and sandy loam, very stony throughout; may be classified as fruit land varying from 15 per cent to 40 per cent value. Timber, generally scorched by fire and burned nearly clear in patches; second growth birch, cedar, and fir, willow, etc., with scattering of large fir to 18 inches diameter most of which has been fire scorched; of lumber value.

S53. 24.—Rising back to SE. in fairly easy slopes from Adams lake. May be classified as fruit lands to 800 feet above lake, of 25 to 40 per cent value, and as farm lands to 1,200 feet, of 30 to 40 per cent value; beyond that rises steadily in

timbered slopes to crests of highlands. Soil light sandy loam (brown and yellow) with stones and gravel, very stony in parts. Timber, second growth from 8 inches to 12 inches diameter of fir, jack pine, birch, poplar, with undergrowth of maple, cedar, alder and spruce, all timber in fruit land belt scorched by fire with patches of open brûlé, in south half by section 24, some scattered fir to 18 inches diameter, and cedar to 12 inches diameter, cedar larger directly along stream flowing through SW. $\frac{1}{4}$ sec. 24. Not much timber of lumber value.

PART SEC. 25.—Steep stony ascent from lake, then rising, back in fairly easy slopes to 800 feet above Adams lake. Soil, light sandy loam, generally very stony, patches of good land here and there might grow fruit but would not exceed a 40 per cent value; rolling and broken. Timber, small fir, poplar, birch, cedar and maple. Scorched throughout by fire, scattered fir to 18 inches, of poor lumber value, if any.

FRAC. SECS. 27 AND 28.—Part of sec. 27 consists of steep ascent from lake, shows rock outcrops and is very stony, of doubtful agricultural value. For the rest there is a general easy slope to northwest, rising to 300 feet above Adams lake, rolling land more broken near the lake. May be classed as fruit land of from 25 to 35 per cent value. Soil light sandy loam, very stony throughout, soil better in western and southern parts, very stony in west, not so stony in south part. Timber, second growth fir, jack pine and birch with undergrowth of willow, poplar, birch and alder, occasional fir from 15 to 20 inches diameter in frac. sec. 27 and frac. NE. $\frac{1}{4}$ sec. 28, some good fir of lumber value in NW. $\frac{1}{4}$ sec. 28, generally speaking the brush is fairly open and would be easily cleared.

FRAC SECS. 29, 20 AND 19.—Gentle slope to northwest with a steep ascent from lake, increasing in length and steepness in sec. 19; in S. $\frac{1}{2}$ sec. 19, nearly level. May be classed as fruit lands of from 10 per cent to 50 per cent value up to an altitude of 800 feet above the lake, small corners of farm land in NW. $\frac{1}{4}$'s of sec. 19 and 24. Some good fruit land in S. $\frac{1}{2}$ sec. 29 and N. $\frac{1}{2}$ sec. 19 but rolling and broken in places. Soil light sandy loam, generally very stony. Timber, Douglas fir to 20 inches diameter scattered throughout to 30 inches on steep slope to lake, but rather scraggy cedar to 10 inches in low places, of lumber value though most of larger trees are scorched, other timber, small fir, birch, cedar, hemlock, white pine and alder, bush has been scorched in many places, W. $\frac{1}{2}$ sec. 29 most recently burned. On some of the steep slopes along the lake shore, are open patches of grass land suitable for grazing but of small extent. On SE. $\frac{1}{4}$ sec. 29 has been built a cedar shack, 16 by 24 feet by some squatter, name unknown.

Tps. 16 and 17, R. 13, W. 6th Mer. *J. E. Ross, D.L.S., 1909.*

The lands surveyed in these townships lie in the vicinity of Grande Prairie, a village 17 miles south of the Canadian Pacific Railway station at Ducks. From Grande Prairie direct roads run to Ducks, Kamloops, Nicola, Salmon Arm and Okanagan. A stage makes return trips from Ducks on Wednesdays and Saturdays, carrying mail, passengers and express. The chief industry of the country around Grande Prairie is the raising of cattle, hogs and horses; large quantities of hay, peas and oats are grown for winter feed. The elevation of Grande Prairie is 2050 feet above sea-level, and the land surveyed this season is all at a higher altitude, reaching an elevation of 4,200 feet. Small fruit can be grown very successfully at Grande Prairie, but it is not convenient to any market. To reach the nearest market, Kamloops, requires a full day's journey, and then the demand is limited. Apples grow fairly well, but are not now grown for shipment. Garden produce also does well, but is mostly raised for local use. The climate is that of the Dry Belt, hot and dusty in summer, with cool, clear nights; clear, cold and windy weather prevails in winter, with light falls of dry snow. The valley is well irrigated with water from Salmon river, Monte lake and Ingram creek. The country at Grande Prairie and along the Nicola road does not appear to be subject to summer frosts, but land at a slightly

higher altitude would be decidedly subject to them. Throughout this district there is an enormous deposit of low grade iron ore, which stands out prominently in the reddish-brown cliffs overlooking Monte lake, Grande Prairie and the Nicola road. As a result of the presence of this ore body the compass needle is very erratic, varying as much as 8 degrees on either side of the normal variation, which is about $25^{\circ} 50'$ in this district. The local attraction made it quite impossible to get satisfactory magnetic observations in these townships. The lands surveyed in townships 16 and 17, range 13, consist of the valley of Ingram creek, hay meadows in township 16, and part of the south limit of the Railway Belt. The valley of Ingram creek rises suddenly from Salmon river, ascending 1,500 feet in the first mile and a half; beyond that the rise is gentle. The creek has a width of about 15 links and an average depth of 8 inches. Near Salmon river the hills are open and afford good grazing, but higher up the valley there is a belt of good fir averaging 2 feet in diameter; 3 miles from Salmon river the fir gives place to jack pine less than 6 inches in diameter. A fire has killed the jack pine in patches along the valley. Close to the creek there is some rich bottom land covered with dense spruce, but beyond this the ground is hilly and the soil, hard clay, often rocky. A good trail runs up the valley to the meadows. A wagon road could be constructed at moderate cost, but the first 2 miles would necessarily be steep. A settler has located in the southeast quarter of section 34, township 16, range 13, on some meadows which lie along a small tributary of Ingram creek. These meadows are 55 acres in area and produce a good crop of wild hay. Another meadow extends through section 28 and the southeast quarter of section 29. This meadow has a total area of nearly 300 acres, of which 185 lie within the Railway Belt. These meadows are very rough and marshy, and covered with scrub, but could be drained at moderate cost. We found posts of provincial surveys at both ends of this big meadow, the surveys protruding within the limit of the Belt. A trail has been built along the west side of the meadow, and hay has been cut at both ends. At these meadows frosts were of almost nightly occurrence during the early part of August. Apart from hay growing the valley is of no use, and the timber is of no value. In township 17, range 14, the land surveyed consists of an open hillside covered with luscious Saskatoon or olally berries, with no timber except sparse bull pine. It lies to the east of the Upper Salmon river. In township 16, range 14, there is a good growth of large fir in the southeast quarter of section 36 and in section 25. The east boundary of section 25 cuts a lake 60 chains long, locally known as 'Woods lake.' From this lake to the limit of the Belt the country is fairly open, covered with windfall. The elevation here is 4,000 feet above sea-level. A small tributary of Salmon river crosses section 24. There is no land of agricultural value near Woods lake. A rough trail has been cut out from Nicola road. The balance of the land surveyed in this township consisted of the Salmon river valley up to the Monte Hills forest reserve, and a traverse of the Grand Prairie-Nicola wagon road to its intersection with the south limit of the Railway Belt on the south boundary of section 24, township 16, range 15. Section or witness corners were put in on the belt boundary and at section lines crossed. The Salmon river valley here is narrow with high precipitous sides. There is a strip of good bottom land along the valley, but the dense growth of cotton-wood, birch and alder would make it expensive to clear. A fair wagon road runs along the valley to Nicola river, reaching Nicola lake at Quilchena. Salmon river here is small, about 30 links wide, and 12 inches deep, with a steady, gradual fall. There is some fair bull pine and fir, up to 30 inches in diameter on the hills along the valley. Half a mile northeast of the forest reserve the valley narrows down to a mere canyon, with rockslides at intervals along its banks. There are some small patches of bottom land within the reserve. The timber is chiefly fir, fairly dense, up to 24 inches in diameter. No game was seen with the exception of a few deer and grouse.

Tp. 17, R. 13, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 17, NW. $\frac{1}{4}$; SEC. 18, NE. $\frac{1}{4}$ SW. $\frac{1}{4}$; SEC. 20, SE. $\frac{1}{4}$; SEC. 21, S. $\frac{1}{2}$, PART NE. $\frac{1}{4}$, PART NW. $\frac{1}{4}$; SEC. 22, S. $\frac{1}{2}$, PART NW. $\frac{1}{4}$.—Steep rough slopes generally from

950 to 2,000 feet above river, slopes gentle in places and suitable for cultivation and small benches suitable for cultivation, very dry, would require irrigation, some of lower parts might possibly be irrigated from Salmon river and Ingram creek, but greater part impossible to irrigate, soil light clay and gravel, small boulders in places, bull pine, fir, and jack pine, generally scrubby, but of timber value in places, average 15 inches, land 15 to 40 per cent farm, grass through timber affording fair grazing.

SEC. 23, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$ (S. $\frac{1}{2}$).—Rough and hilly, a small area of low bench land to NW. part and along Ingram creek, slopes to east of Ingram creek very steep, very dry, possible to irrigate from Ingram creek, from 1,000 to 1,220 feet above South Thompson river to west of creek, and from 1,085 feet to mountains to east of creek, soil light clay, and gravel, very stony along creek, small jack pine principally, a few bull pine and fir 8 inches average, of some value as timber, lands from 25 to 50 per cent value as farm land, fair grass for grazing.

SW. $\frac{1}{4}$.—Steep rolling slopes rising to SW. from Ingram creek with some bench land on higher parts that could be cultivated from 1,000 to 1,600 feet above river, not of much value, very dry, might be irrigated from Ingram creek, light clay soil, gravelly in parts, open spaces, small jack pine, bull pine and fir, no timber of value, fair grass for grazing.

SEC. 25, PART SE. $\frac{1}{4}$, PART SW. $\frac{1}{4}$; SEC. 26, PART SE. $\frac{1}{4}$.—Land on gentle slopes to north part suitable for cultivation, steep slopes to south, from 890 to 1,800 feet above river, very dry, require irrigation, light clay soil with some gravel, solid rock to west on slopes, bull pine and fir scattered fir principally on higher slopes, 12 inches average, of some timber value, lands 30 per cent farm, fair grazing throughout.

SEC. 32, PART NE. $\frac{1}{4}$, PART NW. $\frac{1}{4}$; SEC. 33, N. $\frac{1}{2}$; SEC. 34, N. $\frac{1}{2}$; SEC. 35, N. $\frac{1}{2}$; SEC. 36, NE. $\frac{1}{4}$ (N. $\frac{1}{2}$), NW. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Slopes in this part steep and rocky, cliffs in part, lands in part on gentle slopes and rolling but of no value as agricultural land, in sec. 32, rolling lands partially suitable for cultivation but not much value for agriculture, in sec. 33, part of SW. $\frac{1}{4}$ on gentle slopes the greater part solid rock cliffs, and extending to east through sec. 34, in SE. $\frac{1}{4}$ sec. 34, slopes more gentle, through sections 35 and 36 steep and rocky, practically no timber, a few scattered bull pine and fir of scrubby nature, grass poor, some grazing.

Tp. 18, R. 13, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SECS. 3, 4, 9 and 10.—Rolling bench land, slopes, rising to east and west, these sections being along bottom of draw between hills on either side, from an elevation of 2,450 feet above the South Thompson river, to the south part of sections 3 and 4 the slopes fall rapidly to the Grand Prairie flats, a number of low spots of small area, dry, but showing evidences of having contained water to 3 or 4 feet, very alkaline, from 10 to 15 acres of meadow land lying in NE. $\frac{1}{4}$ and NW. $\frac{1}{4}$ of secs. 9 and 10 respectively, from which a few tons of hay may be obtained, considerable part of the land in these sections could be cultivated, but of no value as agricultural lands, very dry and no water for irrigation purposes and summer frosts are prevalent, soil light sandy clay loam with gravel in places, timber generally small bushy jack pine, poplar and fir, clumps of fir of some timber value and in northern part of secs. 3 and 4 fir 10 inches of some timber value, grass affording some grazing throughout sections.

SECS. 15, 16 and 17.—Rolling bench land from 2,070 to 2,900 feet above river Paxton Creek valley through section 16, no water, slopes rising to SW. from creek and to the east from creek, to a large extent land is suitable for cultivation but of no value for agriculture on account of being very dry and liable to summer frosts, soil light, sandy clay with gravel, solid rock outcropping in places, small jack pine from 2 to 6 inches generally and small poplar, with a few fair sized fir to 15 inches, not of profitable timber value, scattered throughout the section, along the east of creek, some clumps of good fir, timber from 10 inches to 20 inches, of profitable timber value, pine grass throughout affording some grazing.

SEC. 18, NE. $\frac{1}{4}$.—A few acres of flat land in bottom of valley in NW. part suitable for farming, to the south are steep slopes rising to south, elevation from 1,935 to 2,430

feet above river, soil sandy clay with some gravel, black loam on low parts, on flat land, poplar, willow brush and some spruce, a few of good size to 20 inches, not of profitable timber value, small jack pine and fir generally of small size, 6 inches average on slopes to south, grass affording some grazing, land 35 per cent value as farm land.

PART NW. $\frac{1}{4}$.—A few acres of low flat land on west half of legal subdivision 13, steep, rough slopes to south, elevation from 1,835 to 2,300 feet above river, soil sandy clay and gravel, black loam on flat land, partially open on flat land, small poplar, willow, fir and jack pine, not of profitable timber value, flat land 35 per cent value as farm land.

SEC. 19, NE. $\frac{1}{4}$; NW. $\frac{1}{4}$; SW. $\frac{1}{2}$, N. $\frac{1}{2}$.—Steep, rolling slopes from 1,950 to 2,795 feet above river, no land suitable for agriculture, soil light clay and gravel with scattered boulders, thinly covered with bull pine and fir up to 30 inches of timber value, no undergrowth, pine grass, fair grazing.

SEC. 20, SE. $\frac{1}{4}$.—Bench land, very gentle slopes—from 1,940 to 2,360 feet above river, would make fair farm land if possible to irrigate; creek bed running through quarter, dry; soil, sandy clay with some gravel; small jack pine and scattered fir to 20 inches, of some timber value; land suitable for cultivation but very dry and no water for irrigation: land of doubtful value for agricultural purposes.

SW. $\frac{1}{4}$, N. $\frac{1}{2}$.—Rolling land, 1,950 feet above river, suitable for cultivation, meadow land to north of lake which lies in southern part, hay land, soil sandy clay with some gravel, black loam on meadow land, small poplar, jack pine and scattered fir to 20 inches of some timber value, land 20 to 35 per cent value as farm land, grass affording fair grazing.

SEC. 21, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land rolling from 1,845 to 2,540 feet above river, to a large extent lands suitable for cultivation, very dry, require plenty of irrigation, danger of summer frosts, soil sandy clay with some gravel, small jack pine and poplar with scattered fir of average 12 inches, not of profitable timber value, grass affording fair grazing, land of doubtful value for agricultural purposes.

SECS. 22 AND 23.—Bench land on gentle slopes, rolling, to a large extent lands suitable for cultivation, very dry, require irrigation, soil sandy clay with gravel, small boulders in places, small jack pine and some small poplar and willow brush, with some scattered fir to 12 inches, not of profitable timber value, land of doubtful value for agricultural purposes.

SEC. 25, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Bench land rolling towards west side, slopes very steep towards east, from 1,300 to 2,500 feet above river on east and from 1,700 to 2,400 on west, partially suitable for cultivation on west, soil light sandy clay and gravel, boulders, scattered fir of 12 inches average, not profitable timber value, land of doubtful agricultural value, dry creek bed in NW. $\frac{1}{4}$, some grass through section.

SEC. 26; SEC. 27, NE. $\frac{1}{4}$ (S. $\frac{1}{2}$), SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench rising steadily to the south, broken by gullies from 1,690 to 2,400 feet above river, ravine of dry creek runs through section 26, NW. $\frac{1}{4}$ of sec. 26, very rough and broken, also south half sec. 27, creek running through SW. of 27 with a very little water in pools along bed, soil light sandy clay and gravel, with some large boulders scattered over surface, small jack pine and poplar to 4 inches, a very few fir of 12 inches average to SW. of 26, parts have been burnt over and are fairly open, land of doubtful value for agricultural purposes.

SEC. 28, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Bench land rough and rolling, broken by ravine of small creek, dry towards mouth, water higher up slopes, very steep and rocky to NW. from 1,790 to 2,490 feet above river, partially suitable for cultivation, very dry, narrow strip of low land along creek which would make fair farm land, soil light clay with small boulders in places, solid rock showing to west, small jack pine, poplar with scattered fir and bull pine of fair size, of no profitable timber value, lands of doubtful value for agricultural purposes, bottom land 35 per cent value as farm land, poor grass for grazing through section.

SEC. 29, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Steep rolling slopes rising to NW. generally, ridges running out in SE. direction, from 1,960 to 2,800 feet above river, land

partially suitable for cultivation, soil light clay with some gravel, thick small jack pine 4 inches in NE. $\frac{1}{4}$, bull pine and fir 10 to 25 inches to west and south, of some timber value, clean bush, fair grass affording grazing, land of doubtful value for agricultural purposes.

A. V. Chase, D.L.S., 1910.—SEC. 30; 31; 32; 29, NW. $\frac{1}{4}$; 33, NW. $\frac{1}{4}$.—Nearly all over 4,000 feet above sea-level, no agricultural value, rock on the north, running into dry sandy soil on the south, timber chiefly scrub in the north part, running into scattered bull pine and occasional fir to the south, poor grazing.

A. J. Campbell, D.L.S., 1909.—SEC. 33, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough and broken lands, deep ravines of two creeks on east and west with ridge between, very steep rocky slope to west of creek in SW. $\frac{1}{4}$, a small strip of low land along this creek, good water in both creeks, good spring rising in NE. corner, soil sandy clay, some good patches of fir on ridge between creek, 20 inches, of some timber value, generally small jack pine and poplar, fair grass affording some grazing, land along creek 25 per cent farm, rest of doubtful agricultural value.

SEC. 34, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$ (N. $\frac{1}{2}$), SW. $\frac{1}{4}$.—Rough broken land rising from 1,650 to 2,600 feet above river, broken in NE. part by deep ravine of creek, good water, south half of NE. $\frac{1}{4}$ and north half of SE. $\frac{1}{4}$, cancelled homestead, land partially suitable for cultivation, high and dry, requires irrigation, soil sandy clay and gravel with boulders in places, small jack pine and poplar with clumps of fir of 8 inches average, no timber value, land of doubtful agricultural value.

SEC. 35.—Legal subdivisions 4, 6, 7 and 11 disposed of, low land and marshy land along creek, in remainder of section slopes rise on each side directly from creek leaving no low land, bench land to south of creek from 1,545 to 1,690 feet above river, rough and hilly, very dry, possible to irrigate from creek, but not sufficient water, to north of creek slopes steep and rolling from 1,545 to 2,050 feet above river, partially suitable for cultivation, soil sandy clay and gravel, to north of creek, thinly covered with fir and some bull pine 10 inches average, of some timber value, also small poplar and jack pine, to south, small poplar and jack pine land from 15 to 35 per cent farm land.

SEC. 36, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough and hilly bench land, steep slopes rising from Bole creek in NE. corner, from 1,345 to 1,800 feet on knoll in north part of section falling to west in south, small lake on west boundary in SW. $\frac{1}{4}$, bad water, a few small low spots through section, land partially suitable for cultivation, very dry, require irrigation, soil sandy clay and gravel with boulders scattered over, small jack pine and poplar, thin, with bull pine and fir to east 10 inches, no timber value, land of doubtful agricultural value.

J. E. Ross, D.L.S., 1909.—The land surveyed in this township lies on both sides of Paxton valley, the greater part being to the south. Paxton valley extends to the east of Monte lake, the general trend of the valley being northeast. It varies from a quarter to a half mile in width, and where cleared and cultivated yields good crops of hay and grain. Most vegetables grow fairly well, but the high elevation, nearly 3,000 feet above sea-level, prevents the successful growth of fruit. A small stream, Paxton creek, flows westward through the valley into Monte creek. This creek is usually dry in places during the summer months. The water is good, although slightly alkaline. The timber on the north side of the valley consists chiefly of bull pine and fir averaging from 20 to 36 inches in diameter. The timber in the bottom and on the south side is smaller, but grows much thicker, consisting chiefly of fir, jack pine, cottonwood and poplar. At an average elevation of about 800 feet above the valley there extends to the south towards Grande Prairie a rolling and hilly table land well timbered with fir and bull pine, averaging 24 inches in diameter. The soil is a light sandy loam with a hard clay subsoil. On account of the absence of water and the high elevation, the land is useless for agricultural purposes. It affords fairly good grazing, however. A couple of small springs of good water have been found.

There are some small meadows in sections 9 and 10, township 18, range 13, of about 10 acres total area. They produce a good crop of wild hay. A rough road has been cut through the bush from Paxton valley to these meadows. To the north of Paxton valley there is an elevated, rolling bench, wooded with fir and bull pine of medium size. There is a dense growth of jack pine in places. In the northeast quarter of section 25, township 18, range 14, there is a pond of fairly good water 10 acres in area. To the south of this pond there is a wild hay meadow three acres in extent. With the exception of this meadow, there is no land of agricultural value in the sections surveyed. Ducks, 12 miles away, is the nearest railway station. A good road runs through the valley to the Ducks-Grande Prairie road. The climate is usually dry in summer like the rest of the Dry Belt, but there is considerable rain in the fall. The winters are cold, but the snowfall is light. The valley would be subject to summer frosts.

Tp. 19, R. 13, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 1, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, (W. $\frac{1}{2}$).—Steep, rough slopes rising to west from road, from 1,600 to 2,225 feet above river, of no agricultural value, sandy clay loam and gravel, small jack pine and poplar, a few scattered fir and bull pine on higher slopes (8 inches), not of timber value, fair grass for grazing.

SEC. 1, SE. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Rough rolling bench land from 1,500 to 1,775 feet above river, very dry, requires irrigation, sandy clay soil and gravel, small jack pine with a few scattered bull pine 10 inches, not of profitable timber value, some grazing.

A. V. Chase, D.L.S., 1910.—SECS. 2 AND 3.—Nearly all over 4,000 feet, no agricultural value, rather open and rolling, scattered scrub timber, jack pine and fir, some open bare rock, poor grazing.

The southeast corner of the Martin Mountain reserve, including sections 4, 5, 8 and 9 is all over 4,000 feet above sea, has been burned over, and has no value in timber. These sections consist almost entirely of bald rock, with small strips of scrub timber growing in gulches and small valleys, consisting of small jack pine, small poplars, and some small fir. There is no grazing of any value.

SEC. 6.—Out of the range of the completely burned area, and holds more jack pine up to 10 inches diameter thickly placed in parts, no agricultural value, poor grazing.

SEC. 7.—Has some workable slopes from 3,600 to 4,000 feet above sea level in northwest $\frac{1}{4}$, but altitude destroys agricultural value, timber much the same as sec. 6, but with more small poplar and occasional white birch.

SECS. 10, 11, 14, SW. $\frac{1}{4}$.—Nearly all over 4,000 feet above sea-level, rather close growth of small jack pine, with occasional fir to 15 inches diameter, no agricultural value or grazing.

A. J. Campbell, D.L.S., 1909.—SEC. 12, NE. $\frac{1}{4}$.—Small area of low swampy land along creek in NW. part which would make good farm land, high hill in SW. part to west of creek, rolling bench land along east, from 1,550 to 1,750 feet, part to east suitable for cultivation, would require irrigation, sandy clay loam, small jack pine and poplar generally with fir in clumps from 10 inches to 20 inches to east side, spruce on swampy land, of some timber value, land from 25 to 50 per cent farm value, grass among timber.

SEC. 12, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Steep, rough slopes rising to west from 1,600 to 2,220 feet, small area of low land along creek in NE. corner and some bench land along east side suitable for cultivation, two small creeks with good water run through section, could be used for irrigation, soil sandy clay loam, small jack pine, and poplar with a few fir to 6 inches scattered over, land 15 to 50 per cent farm value, grass for grazing.

SEC. 12, SE. $\frac{1}{4}$.—Valley of creek narrow with steep slopes on either side, very small area of low swampy land to north of quarter, bench land, rolling to east and west of steep slopes from valley, from 1,500 to 1,835 feet, sandy clay loam, small jack pine and poplar with scattered fir 10 to 20 inches in clumps, of some timber value, land, 15 to 50 per cent farm land, grazing.

SEC. 13, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Rolling bench land suitable for cultivation, from 1,715 to 1,820 feet, sandy clay loam, small jack pine and poplar with scattered fir and in clumps from 10 to 20 inches, not of much timber value, NE. $\frac{1}{4}$ a cancelled homestead, land 30 per cent farm value, fair grazing.

SEC. 13, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Low land along Bolem creek and rolling bench land suitable for cultivation, sandy clay loam with some gravel, small jack pine and poplar generally with scattered fir, birch, poplar and very thick willow brush on low land with some spruce of fair size, of some timber value, land from 20 to 50 per cent value as farm land, fair grazing.

SEC. 14, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Low land in NE. parts along creeks, rolling bench land along east side suitable for cultivation and bench land with small marshes to north of NW. $\frac{1}{4}$, from 1,850 to 2,330 feet above river, soil, sandy clay loam, thick small jack pine and spruce, some fir up to 10 inches in clumps, particularly near the creeks land from 15 to 50 per cent farm value fair grazing.

A. V. Chase, D.L.S., 1910.—SEC. 15.—All over 4,000 feet above sea-level, very rocky, only scrub timber, some open patches, poor grazing.

SECS. 16 AND 17.—Broken, stony, and useless, no grazing, scrub timber in gulches, a few stretches of jack pine to 12 inches in north $\frac{1}{2}$, with scattered trees of fir, some poplar brush, all over 4,000 feet.

SEC. 18.—From 3,100 to over 4,000 feet above sea-level, a few workable slopes in west $\frac{1}{2}$, of sandy loam soil, would not call it farm value, too broken, needs water, all covered with a timber mixture of jack pine, spruce, fir, poplar, birch, etc., in scrub and small trees of no lumber value, rather poor grazing.

SEC. 19.—From 3,000 to 4,000 feet above sea-level, possible agricultural value so far as the soil and altitude are concerned, that is in the northwest, northeast, and southwest quarters, the land is rolling and in some places rather broken; soil, light sandy loam, with very few stones, some depressions show black loam, no source of water, some mixture of timber all over section as in 18, only fair grazing as a whole.

SECS. 20 AND 21.—From 3,220 to over 4,000 feet above sea-level, possible farm value only in north $\frac{1}{2}$, a mixture of sandy and dark loam soil, with more slope in places than to the west, timber on heights in south halves contains a good deal of scattered spruce to 15 inches, with abundance of small jack pine, other timbers poplar, birch, spruce, etc., to 10 inches appear on lower levels in north halves, grazing poor.

SEC. 22, S. $\frac{1}{2}$, NW. $\frac{1}{4}$.—From 3,500 to 4,000 feet above sea-level, steep and rolling, no agricultural value, dense scrub growth of small jack pine and poplar, a few small areas of fir to 15 inches, poor grazing.

A. J. Campbell, D.L.S., 1909.—SEC. 22, NE. $\frac{1}{4}$.—Rough broken country, valley of Bolem creek, very deep and narrow with steep sides, of no agricultural value, from 2,050 to 2,600 feet above river, sandy clay loam and gravel, thick small jack pine, spruce with scattered fir to 8 inches, grass very poor.

SEC. 23, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough broken bench land, ravine of creek through NW. and SE. quarters, low pieces and fairly level pieces, generally small, suitable for cultivation, sandy loam and clay loam with gravel, thick small jack pine, spruce, fir, poplar and birch with clumps of fir up to 10 inches particularly in SW. $\frac{1}{4}$ to north of Bolem creek, land of very doubtful agricultural value, grass in places through section.

SEC. 24, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Rough, hilly country generally, small lake about 40 acres on north boundary, good water, elevation 1,685 feet above river, steep slopes rising to west of lake to 2,175 feet, and high hill to east rising to 1,930 feet above river, bench land running to south from lake, partially suitable for cultivation, sandy clay and sandy clay loam and gravel, small poplar, jack pine with clumps of fir from 5 inches to 20 inches, not of much timber value, land 25 per cent farm value, grass through section.

SEC. 25, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land along east with steep slope of mountain to west, part of lake on SW. corner, bench land suitable for cultivation, from

1,600 feet and upwards, sandy clay loam with some gravel, small poplar and jack pine with a few scattered fir of fair size, land 30 per cent farm value, some grazing.

SEC. 27, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Narrow valley at head of Bole creek, steep slopes on either side rising from 2,200 to 2,700 feet, on west, to 2,500 feet and upwards on east, no land of agricultural value, sandy clay soil, very gravelly in places, thick small jack pine and poplar, a few fir 10 inches to 20 inches scattered and in clumps, not of profitable timber value, grass poor, some grazing.

SEC. 28, NE. $\frac{1}{4}$.—Rolling bench land from 2,200 feet to 2,530 feet above river, land could be cultivated, but of very doubtful agricultural value, slopes steep in NE. corner and covered with boulders, soil sandy clay and gravel, small jack pine, poplar and willow brush, scattered fir up to 20 inches and some small spruce, grass through timber affording some grazing.

NW. $\frac{1}{4}$.—Rolling bench land from 1,800 to 2,220 feet above river, land in NW. part make fair farm land, all of quarter could be cultivated, soil sandy clay loam, black loam in low places, small jack pine, poplar and willow brush with a few scattered fir to 10 inches, grass poor, land to 30 per cent value as farm land.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough and hilly bench land from 2,060 to 2,700 feet above river, some small pieces of land suitable for cultivation, but generally too rough for agriculture, soil sandy clay loam with black loam in places and gravel, small jack pine and poplar with considerable fir of average 10 inches, of some timber value, not much grass, land to 20 per cent value as farm.

SEC. 29, SE. $\frac{1}{4}$.—Rough, hilly bench land from 1,800 to 2,300 feet above river, partially suitable for cultivation, not of much value, sandy clay loam, thick small jack pine, poplar and willow brush, land 15 per cent value as farm land, fair grazing.

SW. $\frac{1}{4}$.—Area of low bench land to SW. of creek would make good farm land, good creek running through quarter, rough and hilly to SE. and rocky hill to NW., soil sandy clay loam and black loam, thick small jack pine on hills, poplar 2 to 12 inches, and fir to 15 inches, and willow brush on low lands, land 25 to 50 per cent farm value, fair grazing.

SEC. 30, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Rocky ridge runs in a northerly direction through NE. $\frac{1}{4}$ falling to creek on east and falling to west rapidly, from 1,400 to 1,775 feet, bench land suitable for cultivation to west of creek in NE. part and good bench land along west, soil sandy clay loam with rock on ridge, fir and bull pine from 8 to 25 inches thinly covering, of some timber value, small bushy fir and poplar, land 15 to 40 per cent farm land, fair grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Bench land from 1,360 to 1,890 feet above river, considerable part suitable for cultivation, rocky in NE. part, sandy clay loam with gravel, fir from 10 to 25 inches scattered over, of some timber value, a few good-sized bull pine and small fir, poplar and some jack pine, land from 15 to 40 per cent farm value, fair grazing.

SEC. 31, SE. $\frac{1}{4}$.—Bench land, rough and rocky in SW. parts, partially suitable for cultivation, from 1,005 to 1,525 feet above river, broken by ravine of good creek through section, soil sandy clay loam, small jack pine, fir poplar and birch, with fir up to 20 inches, and bull pine in SW. parts up to 25 inches, of timber value, land from 15 to 50 per cent farm value, fair grazing.

SEC. 32, NE. $\frac{1}{4}$.—Bench land, rolling slopes, steep in places from 1,325 to 1,830 feet, partially suitable for cultivation, soil sandy clay loam, thick small jack pine, fir, poplar with fir and bull pine from 8 to 25 inches scattered over, of some timber value, land from 25 to 50 per cent farm value, fair grazing.

SEC. 33, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Gently rolling bench land rising to SE. from 1,760 to 2,530 feet partially suitable for cultivation rough and broken by gullies to NE., soil sandy clay loam, thick small jack pine averaging 6 inches and poplar with a few scattered fir of fair size, land 15 to 30 per cent farm value, fair grazing.

SEC. 36 SE. $\frac{1}{4}$.—Bench land and steep slopes rising to west, a small area in SE. corner suitable for cultivation from 1,600 feet and upwards, sandy clay loam with some gravel, small poplar and jack pine with a few scattered fir of fair size, land 30 per cent value as farm land, grazing land.

MARTIN MOUNTAIN FOREST RESERVE.

A. V. Chase, D.L.S., 1910.—The Martin Mountain Forest reserve and its vicinity, comprising parts of township 19, ranges 13 and 14, is composed of a great rocky hill in the southeast part with lands adjacent thereto sloping to the north and west. A small holding of about 5 acres was found under cultivation in the northeast quarter of section 19, township 19, range 14. In this part successful growth of vegetables and cereals was carried on without irrigation at an elevation of about 3,100 feet above sea-level. The soil is of dark loam and quite moist, being in a sort of basin. There are some small patches of land along the north part of the reserve in township 19, range 14, and at the northwest corner of the reserve in township 19, range 13, all at an elevation of from 3,000 to 3,500 feet above sea-level. There is no source of water supply for irrigation purposes in this reserve. Timber is small and occurs only in the extreme westerly part of that part of the reserve in township 19, range 14. Fir and bull pine are found here. The remainder is covered mostly with scrub and small growth of jack pine, poplar, spruce, willow, etc. Fair grazing exists in the green timber in the western part. The lands to the east and south of the reserve not included in examination under the direction of A. O. Wheeler, D.L.S., in 1909, show no agricultural value. Of that part immediately to the south of the reserve probably about one-half is over 4,000 feet above sea-level. A very rocky country is that immediately to the south of the reserve and farther south it becomes of a rolling steep nature. The timber consists of small jack pine with scattered bull pine immediately south of the reserve, with a few small ranges of fir up to 24 inches in diameter and bull pine to the south and southwest. The commercial value of the timber is doubtful. The grazing is generally poor. Immediately to the east of the reserve the land is very high, very little of that part not included in the examination of 1909 being less than 4,000 feet above sea-level. There is no agricultural value herein. The timber is dense brush with jack pine and poplar on the north and a few stretches of fir up to 18 inches in diameter. Grazing is generally poor. To the south the country is more open with scattered scrub, fir and jack pine.

This reserve is composed of a high rock hill in the south easterly part, and attendant slopes to the north and west. Very little land of agricultural value is found, except in the extreme northwest parts where some dark loam soil of moist nature is found. Timber value exists only in the extreme westerly part.

Tp. 20, R. 13, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 4, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land, rough and broken by gullies, ravine of Martin creek, deep and very deep, small parts might be cultivated but not of much value for agriculture, from 1,450 to 2,050 feet above river, soil clay loam and gravel, bull pine and fir from 8 inches to 20 inches to northern part, of timber value, and thick small poplar and jack pine with scattered fir of fair size to south, fair grazing.

SEC. 5, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land along west suitable for cultivation, steep slopes to east with pieces of bench land partially suitable for cultivation, from 940 to 1,760 feet above river, Martin creek runs across NE. quarter, deep ravine, clay loam and gravel, fir and bull pine on hills in NE. part, 8 to 20 inches, of some timber value, small jack pine and poplar to south with scattered fir of fair size, land from 15 to 60 per cent farm value, fair grazing.

SEC. 7, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land, falling rapidly near river and broken by gullies and ravine of Martin creek through NE. and NW. $\frac{1}{4}$'s, from 45 feet above river in NW. corner to 665 feet in SW. and 515 in NE. Considerable part of land suitable for cultivation and the growing of fruit, light clay soil, thinly covered with bull pine and fir from 5 to 20 inches, some good timber but greater part has been logged, particularly in NW. $\frac{1}{4}$, land from 15 to 35 per cent fruit value, fair grazing, Martin creek dry towards mouth, included in timber berth 171. H. Ferguson, squatter, SW. $\frac{1}{4}$.

SEC. 8, NE. $\frac{1}{4}$.—Bench land and steep slopes to north and east, solid rock in northern part and rough and broken to SW., partially suitable for cultivation, from 750 to 1,425 feet above river, light clay soil and rock in parts, bull pine and fir scattered from 10 to 30 inches, of some timber value, land, 15 to 40 per cent farm value, fair grazing.

SEC. 9, SW. $\frac{1}{4}$.—Rough broken country from 1,300 to 1,815 feet above river and upwards, of no agricultural value except in very small pieces, soil light clay loam, scattered bull pine and fir and small bushy fir of some timber value, grass throughout affording some grazing.

SEC. 17, NE. $\frac{1}{4}$.—Ravine of creek running across quarter, steep slopes on each side, very steep and high to west, more gentle to east but rocky, creek bottom very narrow, some small pieces suitable for cultivation, creek rises from 420 to 760 feet above river, soil light clay and gravel, to west of creek bull pine and fir of fair size, of some timber value, to east, very light bush, small fir, poplar and some bull pine, land in creek bottom 25 to 75 per cent fruit, fair grazing land.

SW. $\frac{1}{4}$.—High hill on west boundary, rocky on summit, falling rapidly to north and gently to south and east, steep rock slopes on east boundary, from 380 feet in NW. to 825 in SW., land in draw through centre and on slopes to south, suitable for cultivation, soil light clay, bull pine up to 30 inches on hill, scattered bull pine and fir to 20 inches to east, small fir, jack pine in valley, land 15 to 30 per cent fruit, fair grazing.

R. D. McCaw, D.L.S., 1909.—SEC. 19, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$ (FRAC.).—In east side is a fair amount of rolling bench land about 350 to 450 feet above the South Thompson river, west part has steep broken slopes with much rock, soil light clay loam with clay subsoil, much open land with scattering scrubby fir and bull pine and an occasional tree to 18 inches, bench land has 50 per cent fruit value, irrigation if required could be obtained from Niskonlith lake, fair grazing throughout.

A. J. Campbell, D.L.S., 1909.—SEC. 20, PART NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land and steep rocky slopes rising to east from 230 feet above river and upwards, very small part of land in NE. $\frac{1}{4}$ suitable for cultivation soil light clay and rock with large boulders, bull pine and fir, small fir and poplar from 6 inches to 20 inches, very scattered, not profitable timber value, land 25 per cent fruit value, fair grazing land.

SEC. 26, NE. $\frac{1}{4}$.—Bench land steep slopes rising to SE., bench land in NW. part suitable for cultivation from 1,335 feet above river upwards, soil sandy clay loam, small fir, poplar, birch and jack pine, with some fir and poplar of fair size, not of profitable timber value, land 30 per cent farm value.

SEC. 27, NE. $\frac{1}{4}$.—Rough broken slope rising to south from Harper lake from 1,000 feet and upwards, rocky ridge running to shore of lake with low land in NE. part of quarter, and NW. suitable for cultivation, sandy, clay loam, thick small jack pine, fir, poplar and birch, thick undergrowth, land 40 per cent value as farm land.

SEC. 27, NW. $\frac{1}{4}$.—Low, marshy land running southwesterly from west of Harper lake, very steep slopes to north from 1,000 feet upwards, rising to rocky mountain, steep slopes in SE. corner, soil sandy clay loam with black loam in low parts, small jack pine, poplar, birch and fir, thick willow brush on marshy land scattered bull pine and fir to north, creek draining Harper lake, land 30 to 60 per cent farm value, fair grazing on slopes to north; squatter, Carl Maggett.

SEC. 28, PART NE. $\frac{1}{4}$.—Steep slopes, rocky in part, rising to mountains to north, no land of agricultural value, light clay and sand with gravel, bull pine and fir, thinly covered from 6 to 20 inches of some timber value, fair grazing land.

PART NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Steep, rocky slopes from 600 to 950 feet above river, no land of agricultural value, creek through SW. $\frac{1}{4}$ and ravine, rocky, light clay soil and rock, scattered bull pine and fir from 4 to 20 inches and small fir, not profitable timber value, fair grazing.

SEC. 29, PART NE. $\frac{1}{4}$, PART SE. $\frac{1}{4}$.—Bench land and steep slopes, very rocky and covered with large boulders, some small parts suitable for fruit, soil light clay, very

scattered bull pine and fir from 4 to 20 inches not of profitable timber value, land, 15 to 25 per cent value as fruit land, fair grazing land.

R. D. McCaw, D.L.S., 1909.—SEC. 30, NW. $\frac{1}{4}$ (W. $\frac{1}{2}$), SW. $\frac{1}{4}$ (W. $\frac{1}{2}$); SEC. 31, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Steep slopes, broken in places and often very rough, altitude 450 feet and upwards above the South Thompson river, soil sandy loam, stony, slopes are very open, with a few scattered fir and bull pine to 36 inches diameter, fair grazing land.

A. J. Campbell, D.L.S., 1909.—SEC. 34, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$ (FRAC.).—Bench land, lowest along east side, rising to east and west, rapidly to west to mountains, low swampy spots, soil clay loam and black loam, small jack pine, poplar and fir, thinly covered with bull pine and fir up to 25 inches on slopes to west, land 25 to 60 per cent farm value, fair grazing on slopes to west.

PART SW. $\frac{1}{4}$.—Very steep slopes rising in a northwesterly direction from Harper lake, no agricultural value, thinly covered with fir and bull pine up to 30 inches, of some timber value, fair grazing land.

SEC. 35, NE. $\frac{1}{4}$.—Low land along valley to west part of quarter, slopes rise to hill on west and to mountains on east from 950 to 1,200 feet, and upwards, small lake of about 10 acres near centre of quarter, good water, soil sandy clay loam and black loam, small poplar, fir, jack pine with scattered fir and bull pine to 20 inches on east slopes, land 25 to 75 per cent farm; H. Lampard, squatter.

NW. $\frac{1}{4}$.—Rough, rolling bench land, rocky to north from 850 to 1,350 feet, highest to north, pieces of land suitable for cultivation, sandy clay loam and black loam, small jack pine, fir, poplar and birch with scattered fir up to 12 inches, land 15 to 35 per cent farm.

SEC. 35, SW. $\frac{1}{4}$.—Bench land, rolling, considerable low land to east of Harper lake suitable for farming, from 950 to 1,335 feet, sandy clay loam and black loam, small jack pine, fir, poplar, birch and willow with a few scattered fir on hills up to 12 inches. G. E. Whitney, squatter.

Tp. 21, R. 13, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 2, NE. $\frac{1}{4}$, PART NW. $\frac{1}{4}$.—Rough rolling bench land rising to NE., from 645 feet upwards, partially suitable for cultivation, very dry, requires irrigation, soil light clay and gravel, bull pine and fir from 15 to 30 inches, very scattered, and small jack pine and fir, land 15 to 60 per cent value as farm land, fair grazing.

SEC. 3, PART NE. $\frac{1}{4}$, PART SE. $\frac{1}{4}$.—Rough, rolling bench land from 680 to 850 feet. above river, partially suitable for cultivation light clay and gravel, bull pine and fir from 10 to 30 inches of fair timber value, and small bushy fir, land 45 per cent value as farm land, fair grazing land.

R. D. McCaw, D.L.S., 1909.—SEC. 5, NW. $\frac{1}{4}$; SEC. 6, SE. $\frac{1}{4}$.—Bare hills having no agricultural value, altitude 500 to 700 feet above the South Thompson River, soil stony, sandy loam, scrubby fir and bull pine in some of valleys and on some of the north slopes, fair grazing land.

SEC. 6, NE. $\frac{1}{4}$.—Bare hills having no agricultural value with exception of small flat west of Niskonlith lake, altitude 500 to 600 feet above the South Thompson river, soil very stony loam, scrubby fir, poplar, jack pine and birch around the lake, flat is 50 per cent fruit land, balance is fair grazing land.

NW. $\frac{1}{4}$.—Small area of workable land in NE. corner, rest of quarter is rough and steep, altitude 530 to 1,000 feet above the South Thompson river, soil very stony loam, timber consists of fir to 20 inches, some jack pine and bull pine of fair value, good grazing in places, NE. corner has about 50 per cent fruit value, irrigation may be obtained from Niskonlith river. In timber berth 497.

SW. $\frac{1}{4}$.—Much broken slopes and hilly, 650 to 1,000 feet above the South Thompson river, soil sandy loam, stony, fir to 30 inches and bull pine to 24 inches, with smaller

scrub, good timber value, small flat in interior of quarter contains about 15 acres of 30 per cent fruit land along a small creek, poor grazing value. In timber berth 497.

SEC. 7, SW. $\frac{1}{4}$.—Small area of workable slope along Niskonlith river, 530 to 700 feet above the South Thompson river, soil stony loam, fir and bull pine throughout to 30 inches diameter and of fair value, steep slopes rise to the west, small grazing value. In timber berth 497.

SEC. 7, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$ (Frac.); SEC. 17, W. $\frac{1}{2}$ (Frac.); SEC. 18, W. $\frac{1}{2}$; SEC. 19, W. $\frac{1}{2}$ of W. $\frac{1}{2}$.—Steep slopes often broken, rising from Niskonlith lake, 530 feet and upwards above the South Thompson river, soil very stony loam with rock in many places, fir and bull pine to 30 inches with underscrub in places, of likely timber value, fair grazing land. Part in timber berth 497.

A. J. Campbell, D.L.S., 1909.—SEC. 11, PART NE. $\frac{1}{4}$, PART SE. $\frac{1}{4}$, PART SW. $\frac{1}{4}$.—Steep slopes rising to east from 600 to 950 feet and upwards, bench land in SW. $\frac{1}{4}$ and small area in SE. $\frac{1}{4}$ partially suitable for cultivation, light clay and gravel thinly covered with bull pine and fir 10 inches to 30 inches and small bushy fir, of some timber value, land 45 per cent farm, fair grazing land.

SEC. 14, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Steep slopes rising to east from 190 to 850 feet and upwards, rocky on upper slopes, no land of agricultural value, light clay and gravel partially open, small bushy fir, poplar and jack pine, fair grazing land.

R. D. McCaw, D.L.S., 1909.—SEC. 20, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$ (Frac.).—Small area of gentle slope in east, from this the land rises rapidly to the west, 530 to 1,200 feet above the South Thompson river, soil sandy loam, stony and rocky in places, fir and bull pine to 30 inches scattering with some jack pine, spruce, birch and scrub, timber is of fair value, gentle slope is 50 per cent fruit land and may be easily irrigated, fair grazing throughout.

A. J. Campbell, D.L.S., 1909.—SEC. 23, PART SE. $\frac{1}{4}$.—Rolling bench land to west and north, steep slopes rocky in part to SE., from 35 to 540 feet above river and upwards, partially suitable for cultivation, very dry, requires irrigation, soil light clay loam and gravel, open, a few clumps small poplar and fir, land 25 per cent fruit land, good grazing land.

PART NE. $\frac{1}{4}$.—Rolling bench land to south, ridge on north with steep slopes from 35 to 550 feet above river, partially suitable for cultivation to south, light clay loam and gravel, open, a few bull pine and fir on hill to north, and small bushy fir and poplar, land 25 per cent fruit value, good grazing.

SEC. 24, NE. $\frac{1}{4}$.—Bench land to north, rising to south, slopes very steep in south half, from 720 feet upwards, partially suitable for cultivation, soil clay loam, thinly covered, bull pine and fir, 10 to 25 inches, of some timber value, land 50 per cent farm value, dry, requires irrigation, fair grazing land.

SEC. 24, NW. $\frac{1}{4}$.—Rough, hilly bench land, broken by deep valley along which road runs, steep slopes on each side, land in valley and on lower slopes partially suitable for cultivation, clay loam and gravel, open to north of road, small bushy fir and poplar with a few scattered fir and bull pine up to 25 inches, of some timber value, land 50 per cent farm value, good grazing land.

SEC. 25, SE. $\frac{1}{4}$, PART NE. $\frac{1}{4}$; SEC. 36, SE. $\frac{1}{4}$ (Frac.).—Bench land to south of SE. $\frac{1}{4}$, sec. 25, very steep slopes falling to Chase creek, and rising to north to rocky mountain, steep rocky slopes rising from shore of Little Shuswap lake in sec. 36, no land of agricultural value except a few acres to south of sec. 25, soil, clay loam and light clay with rock, not of much timber value, land 50 per cent farm value, grazing in places.

R. D. McCaw, D.L.S., 1909.—SEC. 29, NE. $\frac{1}{4}$ FRAC.; SEC. 32, SE. $\frac{1}{4}$.—Gently rising from Loakin creek and merging into steep slope on west side, 685 to 1,105 feet above the South Thompson river, soil sandy loam, stony in places, birch, fir, spruce, cedar average 8 inches in diameter with some trees to 20 inches, no lumber value, 50 per cent fruit land, irrigation may be obtained from Loakin creek and a couple of small creeks which flow through the quarters. Part in timber berth 497.

SEC. 29, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Steep slopes often rocky, timbered with fir, jack pine and bull pine to 30 inches, of fair value. In timber berth 497.

SEC. 32, NE. $\frac{1}{4}$; SEC. 33, NW. $\frac{1}{4}$ (FRAC.).—Small area of gentle slope along Loakin creek, steep rocky slopes rise to west and east, 750 feet and upwards above the South Thompson river, soil black clay loam 6 inches clay subsoil, cedar and fir to 16 inches, much of timber has been logged, dense scrub in places, 50 per cent fruit land, irrigation from Loakin creek.

Tp. 22, R. 13, W. 6th Mer. *R. D. McCaw, D.L.S., 1909.*

SEC. 13, NE. $\frac{1}{4}$.—Narrow valley running northwesterly with gradual slopes on each side, 850 to 1,100 feet above the Little Shuswap lake, slopes are usually workable, soil sandy loam often stony, generally small scrubby growth of poplar and fir with a few large trees scattered throughout to 20 inches, no timber of value, 40 per cent farm land, irrigation if needed is difficult to obtain. In timber berth 482.

SE. $\frac{1}{4}$.—Gradual slopes rising to west, 850 to 1,000 feet above Little Shuswap lake, soil sandy loam, often stony, small birch, cedar and a few scattered fir and spruce to 20 inches, rather doubtful timber value, 50 per cent farm land, irrigation if needed is difficult to obtain. In timber berth 482.

NW. $\frac{1}{4}$.—Gentle slopes on each side of saline lake in quarter section, 905 to 1,100 feet above Little Shuswap lake, soil sandy loam, often stony, young poplar, birch, spruce, willow and fir scrub, with some fir and cedar to 30 inches, 50 per cent farm land, difficult to obtain irrigation, west of lake the timber is valuable. In timber berth 482.

SEC. 14, NE. $\frac{1}{4}$ (N. $\frac{1}{2}$), NW. $\frac{1}{4}$.—Generally workable slopes, steep in places, 870 to 1,350 feet above Adams river, soil sandy loam, stony, fir to 24 inches diameter, with small cedar, spruce, birch and jack pine, some cedar to 24 inches, fair timber value, 35 per cent farm land, irrigation if needed is difficult to obtain. In timber berth 482.

SEC. 15, NE. $\frac{1}{4}$.—Usually workable slope rising from Hiuihill creek in NW. corner, 810 to 1,200 feet above Adams river, sandy loam soil, often stony, in NW. part cedars grow to 6 feet diameter, fir to 24 inches, with smaller birch spruce and hemlock, good timber, 50 to 75 per cent farm land, irrigation if needed may be applied from Hiuihill creek to lower parts. In timber berth 482.

NW. $\frac{1}{4}$.—Flat along Hiuihill creek, rest of quarter rolling and rather broken but having much workable land, 750 to 950 feet above Adams river, soil sandy loam, stony, small fir, cedar, birch and spruce with some fir, and cedar to 2 feet diameter, 25 to 75 per cent farm land, irrigation if necessary may be obtained from creek above. In timber berth 482.

SEC. 22, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Sloping land, broken in places, rising from flat along Hiuihill creek, 750 to 1,000 feet above Adams river, sandy and clay loam, some fir to 24 inches and cedar to 6 feet diameter, cotton woods along creek to 3 feet diameter, small spruce, cedar, fir, birch and white pine, 50 to 75 per cent farm land, NE. part 25 per cent fruit land, irrigation not likely necessary. In timber berth 482.

NE. $\frac{1}{4}$.—Much flat land, marshy in parts, rises to NW. 685 to 1,050 feet above Adams river, soil sandy and clay loam with some stone, cedar to 24 inches diameter, with fir and spruce to 18 inches, of timber value, also much small birch, alder and willow scrub, SE. part 25 per cent fruit land, rest is 50 per cent farm land, irrigation can be supplied from small streams through section and Hiuihill creek. In timber berth 482.

SEC. 23, NW. $\frac{1}{4}$.—Workable slope rising from flat along Hiuihill creek 650 to 820 feet above Adams river, soil sandy clay and clay loam, often black, stony subsoil, along creek land is swampy in places, timber consists of growth of small birch, poplar, fir, pine and spruce with some trees up to 30 inches, some timber of value exists on the quarter especially along creek where there are cedars to 5 feet diameter and cottonwoods to 3 feet, with smaller spruce and fir, 50 to 75 per cent fruit land, irrigation not likely needed and if so may be obtained from Hiuihill creek. In timber berth 482.

SW. $\frac{1}{4}$.—Workable slopes falling to Hiuihill creek, 685 to 1,225 feet above Adams river, soil sandy and clay loam, often stony, on lower land along creek are cedars to 4 feet and cottonwoods to 3 feet diameter, also spruce to 24 inches, on slopes are fir, birch and poplar with some fir to 24 inches, good timber value, north part 50 per cent fruit land, south part 25 per cent farming value, in timber berth 482, irrigation for lower parts from creek above.

NE. $\frac{1}{4}$.—Generally flat land with much swampy ground, slope in south part, soil black loam and sandy loam with stone on slopes, swamps can be easily drained, along creek are cedar to 6 feet diameter with fir to 24 inches scattered throughout small birch, poplar and spruce, dense undergrowth, good timber value, 50 per cent fruit land, irrigation not needed.

SE. $\frac{1}{4}$.—Slopes rising to SW., generally workable, 750 to 1,225 feet above Adams river, soil sandy and clay loam, usually stony, fir, cedar, spruce to 24 inches diameter with smaller birch and poplar, much undergrowth in places, good timber value, NW. part 25 per cent fruit land, rest of quarter is 25 to 50 per cent farm value, irrigation if needed may be obtained from Hiuihill creek for lower parts.

SEC. 24, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$ (W. $\frac{1}{2}$), SE. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Slopes rising to east, many parts workable, stony sandy loam, 850 to about 1,200 feet above Adams river, small fir, poplar and willow with cedar in places also some scattering fir to 24 inches, 50 per cent farm land, irrigation if necessary will be difficult to obtain, in timber berth 482.

NW. $\frac{1}{4}$.—Flat in NW. corner, slopes rising to east 600 to 950 feet above Adams river, soil black loam and sandy loam usually stony, firs to 24 inches and cedars to 4 feet along creek, smaller jack pine, fir, birch and spruce, dense undergrowth on flat, some small marshes, ground on flat is swampy, but is easily drained, NW. part 50 per cent fruit land, rest of quarter is 25 per cent to 50 per cent farm land, irrigation difficult to apply on higher slopes, in timber berth 482.

SEC. 25, SW. $\frac{1}{4}$.—Much flat land along Hiuihill creek which is swampy but may be easily drained, workable slopes rise on each side of creek from limits of flat, 560 to 930 feet above Adams river, soil black loam in flat and sandy loam on slopes, usually stony, cedar and spruce to 36 inches grow along creek with much underscrub, slopes are thickly wooded with spruce fir and birch to 18 inches diameter, greater part has 50 to 75 per cent value as fruit land, irrigation not likely necessary, in timber berth 482.

SE. $\frac{1}{4}$.—Rolling slope steep in places but having much workable land, 660 to 1,200 feet above Adams river, soil sandy loam, stony in most parts, fir to 24 inches and smaller cedar, poplar, birch and jack pine, fair timber value, NW. corner of 25 per cent fruit value, rest of quarter has about 25 per cent farming value, irrigation difficult to obtain, in timber berth 482.

NE. $\frac{1}{4}$.—Rolling land with steep slopes in places, 550 to 900 feet above Adams river, soil clay and sandy loam stone and rocky in places, timber consists of cedar and spruce along Hiuihill creek to 30 inches diameter with scattering fir to 24 inches in thick poplar, small cedar and birch second growth, much windfall and underscrub, good timber value, parts along creek are swampy but may be easily drained, 25 to 75 per cent fruit land, irrigation not likely needed, in timber berth 482.

SEC. 25, NW. $\frac{1}{4}$; SEC. 26, SE. $\frac{1}{4}$.—Flat along Hiuihill creek and rising to NW. in gentle slopes, broken in places, 560 to 840 feet above adams river, soil sandy clay with black loam and humus along creek, stone in places, along creek cedars and spruce grow to 30 inches diameter, on slopes fir,, poplar, spruce and birch to 18 inches, much scrub and windfall, 25 to 75 per cent fruit land value, irrigation not likely needed, in timber berth 482, good timber value.

SEC. 26, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Gentle slopes rising to NW. and running into steep slopes in NW. corner, 690 to about 1,400 feet above Adams river, clay and sandy loam soil, often stony, timber is usually small cedar, fir, poplar, birch, spruce and jack pine with

some fir to 24 inches diameter, rather low timber value, SE. part 50 to 75 per cent fruit land, not likely needing irrigation, to NW. of this narrow strip of 25 per cent farm land, in timber berth 482.

SEC. 36, SE. $\frac{1}{4}$.—Gently rolling slopes with steep hill in NW. corner below this and on the north boundary of the quarter is a hay marsh, 550 to 870 feet above Adams river, soil clay and sandy loam, stony and rocky in places fir and cedar up to 24 inches with smaller birch and poplar, much windfall and underscrub, fair timber value, 50 per cent fruit land, irrigation not likely needed, in timber berth 482.

NE. $\frac{1}{4}$.—Narrow swampy valley running north between a rocky knoll in the east and steep slope on west, altitude 750 to 910 feet above Adams river, soil sandy loam with stone in places, cedar to 24 inches diameter in bottom and fir to 24 inches on slopes, the hay marsh of SE. $\frac{1}{4}$ extends into this quarter, 25 per cent fruit land when swamp is drained, in timber berth 482.

SW. $\frac{1}{4}$.—Gradual ascent toward NW. running into steep slope in NW. corner, 600 to about 1,200 feet above Adams river, soil sandy clay and clay loam with a stiff clay in places, growth consists of thick fir cedar, spruce, birch and poplar to about 10 inches diameter with a few larger trees, SE. part 25 per cent fruit land, NW. part 25 per cent farm land, in timber berth 482, irrigation not likely needed.

TP. 23, R. 13, W. 6th Mer. *R. D. McCaw, D.L.S., 1909.*

SEC. 12, SE. $\frac{1}{4}$, NW. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Rough slopes, stony and rocky in places, 510 to 1,200 feet above Adams lake, soil sandy loam, small fir, birch, maple, cedar with a few scattering firs to 18 inches, and an occasional bull pine, no agricultural value, and very small timber value. In timber berth 263.

NE. $\frac{1}{4}$.—Rather rough slope rising from 160 feet to 790 feet above Adams lake, soil clay and sandy loam with gravelly subsoil, stony in parts, small birch, cedar, fir in dead scrub and windfall, small timber value, NE. part 25 per cent fruit land, irrigation in part could be obtained from small creek. In timber berth 263.

SEC. 13, E. $\frac{1}{2}$ (Frac.).—Bench land along Adams lake with rough slopes rising to rear, 790 feet above it, clay and sandy loam stony in the subsoil, growth of small fir and cedar in much dead wood which has been fire killed, very little timber value, 25 to 60 per cent fruit land, irrigation can be obtained from creek running through SW. $\frac{1}{4}$ into N.E. $\frac{1}{4}$. In timber berth 263.

A. O. Wheeler, D.L.S., 1909.—PART SEC. 23.—A narrow strip along lake shore, sloping easily back from lake to SW. Classed as fruit land of 10 per cent to 40 per cent value, soil sandy loam, very stony, timber small fir, cedar, birch, poplar and willow with scattered fir to 20 inches diameter, near lake to 24 inches diameter, of lumber value. Behind strip classed as fruit land, slopes rise more steeply and are thickly timbered with a lot of scattered good fir to 20 inches diameter of lumber value, but are useless for cultivation. All in timber berth 233.

PARTS SEC. 23, 26, 25 and W. $\frac{1}{2}$ 24.—A small flat rising to 150 feet above the lake, classed as fruit land of 30 per cent to 50 per cent value. Behind flat rise steep rocky slopes with grassy openings and scattered timber, may be suitable for grazing purposes, soil on flat, north of and along creek, brown sandy loam with gravel and stones south of creek land broken and rocky, except immediately along lake, soil brown sandy loam, very stony throughout, timber small cedar, birch, fir and willow, second growth with a few scattered fir to 20 inches diameter of slight lumber value, a few cedar to 15 inches diameter along creek. Frank H. Waldrip has squatted on this point which embraces parts of sections 23, 24, 25 and 26.

PART SEC. 24, E. $\frac{1}{2}$.—Small flat rising to 200 feet above lake; classed as fruit land of 60 to 75 per cent value, behind rise steep slopes with grassy opens and scattered timber, suitable for grazing purposes, soil on flat, rich sandy loam, stony in parts, on steep slopes, whitish clayey loam, very stony and gravelly, rocky in places, timber on flat, small birch, fir, poplar and willow, scattered fir to 20 inches diameter, occasional

to 24 inches and bull pine to 18 inches, both of lumber value, on steep slopes, scattering fir and bull pine to 24 inches and 18 inches respectively. E. W. Sturgill has squatted on SE. $\frac{1}{4}$ of sec. 24.

PART SEC. 27.—North of Bush creek a small bench rising to 150 feet above lake, extending north to rocky bluffs, classed as fruit land of 50 to 60 per cent value; to west steep slopes with grassy opens and scattered bull pine on slopes facing south, suitable for grazing. South of Bush creek, a small flat along lake shore, then rising to SW. in broken slopes clad with timber to 500 feet above lake, beyond that elevation worthless for agriculture, classed as fruit land of 10 to 40 per cent value. Soil north of creek brown sandy loam with stones and gravel, south of creek sandy loam, very stony, timber in flat and on bench, second growth fir, birch, jack pine, cedar and willow with occasional fir to 20 inches diameter, odd trees near lake to 30 inches diameter, of lumber value, on slopes south of creek, small fir, birch, jack pine, poplar and willow with scattered fir to 20 inches diameter, of lumber value. All in timber berth 233.

Tp. 24, R. 13, W. 6th Mer. A. O. Wheeler, D.L.S., 1909.

FRAC. SEC. 23; FRAC. SEC. 26; FRAC. SEC. 35; FRAC. SEC. 36; PART SEC. 25; PART SEC. 24.—A rough and broken piece of bench land elevated from 500 to 800 feet above the lake; has been classed as fruit land but would be of poor value, from 10 to 30 per cent; a few spots go to higher value, from 40 to 50 per cent, where the ground is in depressions and there is a deeper deposit of alluvial soil. Between the bench land and the lake are steep slopes with a good many open spaces of grass land and scattered bull pine, which could be used for grazing purposes. Beyond the 800 feet limit fairly easy slopes rising to east extend in sec. 24 to 1,200 feet above lake, has been classed as farm lands of 25 per cent value. Outside the classes named are steep rocky slopes clad with timber and showing rock outcrops, which are unfit for agriculture. Soil a light brown, reddish or yellowish sandy loam, very stony and gravelly throughout, and in parts rocky; timber on steep slopes of bench adjacent to lake are scattered bull pine to 24 inches diameter and fir to 20 inches diameter, both of lumber value; and bench lands and other slopes, generally second growth fir, poplar, birch, willow with scattered larger fir to 18 inches of lumber value along the beds of the creeks are some cedar to 15 inches diameter and cottonwood. A good deal of brulé is found in patches scattered over the area.

FRAC. SEC. 28; FRAC. SEC. 27.—On steep slopes descending to north shore of Agate bay narrow strip of fruit land along lake of 25 per cent to 30 per cent value, upper slopes grazing land with scattered scrubby fir, extending back to rock bluffs, then more heavily timbered. Soil reddish sandy loam, stony and rocky. Timber belt of scrubby fir to 18 inches diameter along lake, of doubtful lumber value, also small fir poplar, cherry and willow; on upper slopes scattering scrubby fir to 24 inches diameter, of doubtful lumber value. In timber berth 233.

FRAC. SEC. 29, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—On steep slopes of valley, rough and broken. Fruit may possibly be grown in places on lower slopes, and east of I. R., of 25 to 35 per cent value, but better suited for grazing; north part is rock bluffs and worthless. Soil light reddish and brown sandy loam with stones, gravel and rock outcrops; better in spots. Timber chiefly second growth fir where timbered, but for most part open grass slopes, suitable for grazing, with scattered scrubby fir. East of I. R. good scattering of fir to 36 inches diameter, scrubby but of lumber value; also small fir, poplar, birch and willow. In timber berth 233.

SW. $\frac{1}{4}$.—Bottom land along Pass creek, rising gently to SW., may be classed as fruit land of 50 to 75 per cent. Soil light sandy loam mixed with fine gravel, stony in spots; along creek rich brown sandy loam, covered by vegetable mould. Timber along creek, cedar to 50 inches diameter, smaller as creek is ascended, scattered growth fir; birch, cedar and hemlock with alder, cherry and willows; south of green belt along creek has been burnt over. Chas. Todd has squatted on SW. $\frac{1}{4}$ sec. 29 and has built house and stable; grows excellent potatoes and other vegetables. Balance of

frac. $\frac{1}{4}$ sec. is steep hillside unsuited for agriculture; is old brulé grown with second growth birch and poplar and scattered green fir to 15 inches diameter. Situated in timber berth 233.

NW. $\frac{1}{4}$.—Bottom land along creek and rising to 200 feet above lake at foot of steep hillside; a limestone bluff is in centre of $\frac{1}{4}$ section. May be classed as fruit land, between steep hillsides, of 50 per cent to 75 per cent value. Soil, rich sandy loam and vegetable mould along creek; elsewhere light, whitish, reddish and brown sandy loam, with small stones and fine gravel in parts. Timber along creek bottom, cedar to 48 inches diameter of good lumber value, second growth fir, birch and poplar with scattered fir to 20 inches of lumber value. Beyond bottom lands are steep hillsides with open patches of bunch grass and scattered scrubby fir suitable as grazing lands. Wagon road to Kamloops passes through $\frac{1}{4}$ sec. on north side of creek. In timber berth 233.

PART SEC. 30, PART SEC. 31.—Bottom land along creek a few chains wide, then ascending gently on both sides to a maximum of 400 feet above lake at base of steep sides of valley. May be classed as fruit lands of 50 to 75 per cent value. Soil rich reddish yellow clayey loam with little or fine gravel covered by vegetable mould on creek bottom, for the balance, brown whitish and reddish sandy or clayey loam with generally small stones and gravel, very stony in places. Timber along creek bottom is excellent cedar to 48 inches diameter and fir to 30 inches diameter; also a thick growth of devils club, willow, etc., elsewhere there is good scattering of fir to 20 inches diameter, occasional to 24 inches, and cedar to 15 inches, both of good lumber value in addition is found small birch, hemlock, spruce and undergrowth, with small poplar near the steep slopes. The lower steep slopes, present on the north side, opens with sparse growth of bunch grass, extending not very high up; above is thick growth of fir and spruce. The south steep slopes are covered by old brulé with second growth fir, birch, poplar, spruce and willow; also scattered bunches of scrubby fir of questionable lumber value; neither slopes are suitable for agriculture. All in timber berth 233.

Tp. 13, R. 14, W. 6th Mer.—*A. V. Chase, D.L.S., 1910.*

SEC. 19.—From 2,550 to 3,500 feet above sea-level, broken by steep rocky gulches, some fir to 18 inches diameter, of probable value on west $\frac{1}{2}$, fair grazing, no agricultural value.

SEC. 20, 21.—From 2,470 to 3,500 feet above sea-level, very steep slopes thickly covered with fir up to 18 inches diameter, of probable good value in 30 years, fair grazing, no agricultural value.

A. J. Campbell, D.L.S., 1909.—SEC. 26; SEC. 27; SEC. 35.—Narrow strip of low land along the Salmon river up to 25 chains wide, good farm land, with very steep rough slopes on either side, of no agricultural value, river from 1,025 to 1,190 above South Thompson, soil sandy clay loam and black loam, poplar, birch, willow and alder brush with a few fir on low lands, scattered fir and bull pine to west and small jack pine to east, 75 per cent farm value.

A. V. Chase, D.L.S., 1910.—SEC. 28, 29, 33.—From 2,550 to over 4,000 feet above sea-level, little timber value is found on the immediate north side of Salmon river here, these sections consist of almost all abruptly broken precipices on the south face, on the plateau stunted and small fir exist which will offer no value under 25 years, poor grazing, no agricultural value.

SECS. 30, 31.—Rolling and steep, very little fir of any kind, many thickets of jack pine to 4 inches diameter, poor grazing as a whole.

SEC. 32.—Many thickets of jack pine to 4 inches diameter, very little fir, running into small flats of sandy loam soil on creek bottom and more open than sec. 31, fair grazing, only possible agricultural value, from 3,400 to 4,000 feet above sea-level.

MONTE HILLS FOREST RESERVE.

A. V. Chase, D.L.S., 1910.—Only a very small portion of this reserve is below an altitude of 4,000 feet, namely, a strip of land varying from one half to a mile and one half wide along the west boundary and a valley running from north to south through the extreme easterly part. The remainder of the reserve is composed almost entirely of great hills of old burn which is at present covered with a dense growth of small jack pine. No land of evident agricultural value was found therein, but considerable grazing value and meadows of wild hay are found in the valley of the eastern part. Timber value is of no account except a small area in the extreme north-west part and a couple of square miles in the extreme southeast.

Tps. 16 and 17, R. 14, W. 6th Mer. *A. V. Chase, D.L.S., 1910.*

The lands immediately to the east of the Monté Hills Forest reserve not included in examination of 1909 are composed almost entirely of a great rocky range of hills rising quickly to an altitude of 4,500 feet above sea-level in places, no agricultural value was found herein. There is a great deal of bare broken rock and high precipitous rock cliffs with some ranges of old burn. While there is considerable scattered growth of fir and some bull pine, this does not as a rule exceed a diameter of 15 inches and is not of any lumber value. Some fair grazing is found on the plateau hill top, pine grass.

J. E. Ross, D.L.S., 1911.—The surveys in these townships were made mainly for the purpose of defining the boundaries of the Monté Hills Forest Reserve. This reserve lies along the southern limit of the Railway Belt, is composed of portions of several townships and comprises an area of 67,840 acres. It is distant about 30 miles in a southeasterly direction from Kamloops and can be reached by a good wagon road from the latter place. The reserve is hilly and broken in places by steep, rocky cliffs. The elevation above sea-level varies from 2,500 to 5,000 feet. The surface is generally well wooded with jack pine and small fir, although in places the timber has been completely burnt off. So far as observed the reserve is not suitable for agriculture. The soil is mostly a poor sand and gravel loam. The fact that in the month of May there was still a considerable depth of snow in the bush, shows that the reserves are factors in maintaining a steady flow of water in the creeks. It is important, therefore, that care should be taken to prevent the destruction of timber by bush fires. The two largest streams crossed were the Salmon river, which traverses the southeastern corner of the reserve, and Monté creek, which rises in the interior of the reserve and flows in a northerly direction.

Tp. 17, Rgs. 14 to 16, W. 6th Mer. *C. H. Taggart, D.L.S., 1911.*

These townships were reached by following the Kamloops-Grand Prairie wagon road for about 12 miles to the point where a branch road leads off to Campbell lake which we followed to its termination. From Campbell lake to Wolf lake the wagon road was very rough. The country along the boundary of the Monté Hills Forest reserve is very rough and mountainous, and densely wooded with jack pine from 3 to 15 inches in diameter and also some scattered fir and spruce up to 40 inches in diameter. The country within the reserve seems to be admirably suitable as a forest reserve, and with proper scientific handling would doubtless become very productive for the better varieties of timber. The soil is a light sandy loam with gravel and rocky subsoil, but in many places rock was found close to the surface and protruding in others. The country, from an agricultural standpoint, is of little value. Very little water can be found. Scuittoe creek is the only permanent stream; all the others are very small and are sure to be wholly dry after the snow has disappeared off the hills. Deer and grouse were the game noticed. Wood for fuel is plentiful. There is no hay, and no stone-quarries nor minerals were noticed.

TP. 17, R. 14, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 1; SEC. 2, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—East half NE. $\frac{1}{4}$, sec. 2, and west half NW. $\frac{1}{4}$, sec. 1, disposed of, with exception of low land along river, no land of agricultural value, steep rough slopes on each side from 1,020 to 2,200 feet on east and from 1,020 to 1,600 feet on west, slopes to west, rocky, soil sandy clay loam and black loam and gravel, poplar, birch, willow and alder on lowland, slopes to east nearly bare, old brûlé to west, scrubby bull pine and fir, no timber value, land 75 per cent farm value, poor grazing.

A. V. Chase, D.L.S., 1910.—SECS. 4 AND 5.—From 3,400 to over 4,000 feet above sea-level, a certain amount of fir to 15 inches diameter is found on side hill in eastern part of these sections, with fair grazing, in the centre are some meadows fit for wild hay growing, and west of these very rolling country with dense small jack pine, no agricultural value otherwise, lumber value doubtful even in 30 years.

SECS. 6 TO 8, 17 TO 20, 29 TO 32.—These are all situated on bald rock slopes of no agricultural value, there is very little timber of any kind except some scattered small jack pine and scrub fir, practically no grazing.

SEC. 9.—From 3,500 to over 4,000 feet above sea-level, some flat sandy loam land in west $\frac{1}{2}$ covered mostly with dense jack pine, it is of no value agriculturally, fair grazing some scattered fir on side hill to east, of doubtful value.

A. J. Campbell, D.L.S., 1909.—SEC. 11, NE. $\frac{1}{4}$.—Low bench land to east with steep rough slopes to west, very dry, requires irrigation, from 1,000 to 1,700 feet above river; soil, clay loam; scattered bull pine and some fir up to 12 inches, and small bushy fir, pine of no timber value, bench land 35 per cent farm, fair grazing.

SE. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Steep rough slopes of no agricultural value, soil clay loam, scattered bull pine and fir to 15 inches and small bushy fir, no timber value, fair grazing.

SEC. 12, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough steep slopes rising to SE., from 910 to 2,225 feet above river, of no agricultural value, soil clay loam and gravel, thinly covered in NE. $\frac{1}{4}$ with fir and a few bull pine to 12 inches, of some timber value, very scattered and scrubby in SE. $\frac{1}{4}$, some grazing.

SEC. 13, PART NW. $\frac{1}{4}$.—Rocky ridge runs out from west covering this part, of no agricultural value, fir and bull pine 8 to 30 inches, of some timber value, some grazing.

SEC. 14, NE. $\frac{1}{4}$.—Rough broken bench land and steep slopes, very rocky, solid rock along east side, from 1,340 to 2,000 feet above river, of no agricultural value, clay loam and rock, scattered bull pine and fir 8 to 30 inches of some timber value, fair grazing

SE. $\frac{1}{4}$.—Bench land along east, fairly level, steep rocky slopes to west, from 1,125 to 1,900 feet above river, bench land suitable for cultivation, very dry, clay loam soil and rock, scattered bull pine and fir 8 to 30 inches, of some timber value, fair grazing land 30 per cent farm value.

A. V. Chase, D.L.S., 1910.—SECS. 16, 21, 28, 33.—These sections are almost all precipitous rock slopes of no value agriculturally or for timber, and with only poor grazing; in the creek botto mare several meadows of an aggregate of not more than 100 acres, these are fit only for wild hay, being wet marshy land at an elevation of about 3,400 to 3,500 feet above sea-level.

A. J. Campbell, D.L.S., 1909.—SEC. 23, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land and steep slopes, broken by deep gullies and ravines from 1,380 to 1,800 feet, small spring creek runs through, parts suitable for cultivation, very dry, difficult to irrigate, of doubtful agricultural value, clay loam, some rock, thinly covered with bull pine and fir 8 to 30 inches, of some timber value, fair grazing.

SEC. 24, PART NE. $\frac{1}{4}$, NW. $\frac{1}{4}$; SEC. 25, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Bench land rough and broken by gullies, from 1,100 to 1,425 feet, possible to cultivate in parts of doubtful value, very dry and would be difficult to irrigate, soil clay loam, thinly covered with fir and bull pine from 10 to 30 inches, of some timber value, fair grazing land.

SEC. 26, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$ (W. $\frac{1}{2}$), SW. $\frac{1}{4}$.—Bench land rising on gentle slopes to west, rough and hilly in parts, particularly in SW. $\frac{1}{4}$, from 1,210 to 2,100 feet, pos-

sible to cultivate, of doubtful agricultural value, very dry and difficult to irrigate, soil clay loam, rocky in places, fir, bull pine 6 to 25 inches, of some timber value, small jack pine to west of section, grazing land.

SEC. 35, NE. $\frac{1}{4}$.—Steep, rocky slope rising to NE. from creek, small area of land in SW. corner suitable for cultivation from 1,050 feet upwards to rocky mountain, clay soil and rock, scrubby bull pine and fir, of no timber value, cancelled homestead, land 40 per cent value as farm, fair grazing.

NW. $\frac{1}{4}$.—Steep rocky slopes rising each way from creek, narrow strip along creek suitable for cultivation, rest of no agricultural value, from 1,060 to 1,500 feet, clay soil and rock, bull pine and fir to west of creek 6 to 20 inches, of some timber value, land 40 per cent value as farm, fair grazing.

SW. $\frac{1}{4}$.—Very small area of low land in NE. corner, steep slopes and bench land from 1,060 to 1,900 feet above river, of no agricultural value, soil clay loam, thinly covered with bull pine and fir from 6 to 20 inches, of some timber value, low land 40 per cent farm value, fair grazing.

SEC. 36, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Rolling bench land and steep slopes rising to NW. from 1,025 to rocky mountain, land in NE. $\frac{1}{4}$ and SE. of NW. $\frac{1}{4}$ suitable for cultivation, very dry, might be irrigated from creek, soil clay loam and rock, thinly covered with bull pine and a few fir to 10 inches, not of much timber value, land 25 to 40 per cent farm value, fair grazing.

PART SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Low land along creek and bench land from 1,025 to 1,210 feet, very dry, could irrigate lower parts from creek, soil clay loam, thinly covered with bull pine and fir, 6 to 20 inches of some timber value, small pond along creek in north part, land 20 to 40 per cent value as farm land, fair grazing.

Tp. 18, R. 14, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 2, NW. $\frac{1}{4}$ (FRAC.) SW. $\frac{1}{4}$ (FRAC.).—Bench land and steep slopes rising to east from Summit lake, from 1,150 to 1,450 feet above river, possible to cultivate in parts, very dry, requires irrigation, of doubtful agricultural value, small area of low swampy land to south of lake, farm land; soil, light clay and gravel, solid rock showing, thinly covered; bull pine and some fir 5 to 25 inches, of some timber value; low land 40 per cent farm, fair grazing.

SEC. 3, NE. $\frac{1}{4}$ (FRAC.).—Steep rough slopes rising to west from Summit lake, very rocky, of no agricultural value, soil light clay and rock, fir and bull pine 5 to 20 inches, of some timber value, grazing.

A. V. Chase, D.L.S., 1910.—SEC. 3, SW. $\frac{1}{4}$, NW. $\frac{1}{4}$; SECS. 4, 9; SEC. 10, SW. $\frac{1}{4}$.—From 3,400 to 4,200 feet above sea, steep rock hills with some bald spots, no agricultural value, a great deal of old burn, some scrub fir and bull pine, pine grass in parts.

SEC. 5 TO 8; SEC. 16, S. $\frac{1}{2}$; NW. $\frac{1}{4}$; SECS. 17, 18.—From 3,400 to 4,500 feet above sea-level, mostly steep rock hills, a good deal of broken rock and gravel in the lower altitudes, no agricultural value, some bull pine and fir in clumps are found but of no commercial value, some bunch grass in open places.

A. J. Campbell, D.L.S., 1909.—SEC. 10, NE. $\frac{1}{4}$ (FRAC.), NW. $\frac{1}{4}$, SE. $\frac{1}{4}$ (FRAC.).—Steep rocky slopes rising from shore of lake, small piece of flat land in NE. corner suitable for cultivation, slopes rise from 1,150 to 2,000 feet falling rapidly to west to Pearse creek, of no agricultural value, soil light clay covering solid rock, scattered bull pine and fir 6 to 20 inches of some timber value, cedar, birch, spruce, fir and poplar of small size in valley Pearse creek, grazing in places.

SEC. 11, NW. $\frac{1}{4}$ (FRAC.), SW. $\frac{1}{4}$ (FRAC.).—Bench land and steep slopes rising to east from Summit lake from 1,150 to 1,450 feet, very dry, difficult to irrigate, of doubtful agricultural value, soil light clay and gravel, thinly covered, bull pine and some fir 5 to 25 inches of some timber value, fair grazing.

SEC. 13, NE. $\frac{1}{4}$.—Low bench land along north, slopes rising to south from 1,730 to 2,100 feet, dry, requires irrigation, soil black loam to north, clay and gravel on slopes,

small poplar, spruce, fir and jack pine, of no timber value, low land, 30 per cent farm, some grazing.

SEC. 14, PART NW. $\frac{1}{4}$, PART SW. $\frac{1}{4}$.—Bench land and steep slopes rough and broken by gullies from 1,150 to 1,650 feet, very dry, of no agricultural value, soil light clay and gravel, boulders in places, scattered bull pine and fir, generally small and scrubby, open spaces, no timber value, grazing poor.

SEC. 15, NW. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Low land and steep slopes to west, rocky, from 1,200 to 1,550 feet above river, partially suitable for cultivation, dry, possible to irrigate from Pearse creek, soil light clay and gravel, rocky in parts, fir, poplar and birch, some fir up to 20 inches of some timber value, land 15 to 50 per cent farm value, grazing.

SEC. 16, NE. $\frac{1}{4}$.—Steep slopes from 1,335 to 2,100 feet above river, no agricultural value, soil light clay and gravel, and broken rock, small spring creek, bull pine and fir in clumps, small size, old brûlé to north, poplar, willow, some bunch grass on open spaces.

A. V. Chase, D.L.S., 1910.—SEC. 19, SEC. 20, W. $\frac{1}{2}$; SEC. 20, SE. $\frac{1}{4}$; SEC. 29, W. $\frac{1}{2}$; SEC. 30, 31.—From 3,400 to 4,000 feet above sea-level, some rolling very dry bench land, very doubtful value, a great deal of steep rocky slopes with deep gullies. Some growth of fir averaging 10 inches in diameter with fir and bull pine to 20 inches diameter in parts, grazing rather poor.

A. J. Campbell, D.L.S., 1909.—SEC. 20, NE. $\frac{1}{4}$.—Bench land rough and broken by deep gullies and very steep slopes to SW. from 1,270 to 2,200 feet, bench land in NW. part suitable for cultivation, very dry and difficult to irrigate, of doubtful agricultural value, soil light clay and gravel, thinly covered with fir 5 to 15 inches, of some timber value, fair grazing.

SEC. 21, PART NW. $\frac{1}{4}$.—Bench land broken to south by ravine of small creek, partially suitable for cultivation to north from 1,200 to 1,550 feet, dry, possible to irrigate parts from creek, soil light clay, gravelly in places, thinly covered with fir from 5 to 12 inches, and some bull pine in east parts to 30 inches, not of profitable timber value, land 25 per cent value as farm, fair grazing.

SW. $\frac{1}{4}$.—Steep rough slopes rising to south and west from 1,200 to 2,000 feet above river, rocky and broken by ravine of creek, of no agricultural value, soil clay and rock, small fir, old brûlé, of no timber value, some grazing.

SEC. 22, PART NW. $\frac{1}{4}$.—Very small areas of low land along Monte creek suitable for farm steep rocky slopes rising to NE. from 1,000 to 1,600 feet above river, soil clay loam and light clay, and some rock, thinly covered with bull pine and some fir, 6 to 25 inches not much timber value, fair grazing, low land 35 per cent farm value.

SEC. 23, SW. $\frac{1}{4}$.—Steep slopes along west and rising to NE. from 1,500 to 1,950 feet above river, broken by gullies, of no agricultural value, soil light clay, partially open, a few bull pine and some fir, scrubby, of no timber value, good grazing,

SE. $\frac{1}{4}$.—Bench land rolling and steep slopes to north, land in SE. corner suitable for cultivation, creek suitable for irrigation, deep ravine to north, from 1,600 to 1,970 feet above river, light clay soil thinly covered with bull pine and fir, 10 to 30 inches of some timber value, land 25 per cent farm value, fair grazing.

SEC. 24.—PART SE $\frac{1}{4}$, SW. $\frac{1}{4}$.—Low land along creek to south, slope rising to north, from 1,630 to 2,400 feet above river, soil light clay and black loam, thinly covered with bull pine and some fir 10 to 35 inches of timber value, land 15 to 40 per cent farm value, fair grazing.

A. V. Chase, D.L.S., 1910.—SEC. 24, N. $\frac{1}{2}$; SEC. 23, N. $\frac{1}{2}$; SEC. 22, NE. $\frac{1}{4}$; SECS. 25, 26; SEC. 27, N. $\frac{1}{2}$, SE. $\frac{1}{4}$; SECS. 34 to 36.—From about 2,400 to 4,200 feet above sea-level, very steep and abruptly rolling country, no agricultural value, rocky in north part, with more soil to south, timber small jack pine with scattered bull pine of fair size to the north, with some small ranges of fir and bull pine to 24 inches in south and southwest parts, grazing fair as a rule.

A. J. Campbell, D.L.S., 1909.—SEC. 27, PART SW. $\frac{1}{4}$.—Steep slopes from 1,250 to 2,000 feet above river, of no agricultural value, some solid rock showing, soil light clay and some rock, thinly covered with bull pine and some fir 10 to 30 inches, of some timber value, fair grazing.

SEC. 28, NE. $\frac{1}{4}$, PART SE. $\frac{1}{4}$.—Steep slopes and rough bench land from 1,200 to 2,000 feet above river, of no agricultural value, soil light clay and gravel, solid rock showing in places on higher slopes, thinly covered with bull pine and fir 10 to 30 inches, of some timber value, fair grazing.

NW. $\frac{1}{4}$.—Monté creek crosses SW. corner, steep slopes rise from creek, rocky in parts, from 1,075 to 1,640 feet above river, of no agricultural value, soil light clay and gravel, solid rock showing, thinly covered with bull pine and fir 10 to 30 inches, of timber value, fair grazing.

SEC. 29, PART NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Steep rocky slopes along west side, some low bench to NE. of SE. $\frac{1}{4}$ of some farm value, soil light clay and gravel, fir of small size, 4 inches, of no timber value, some grazing.

SEC. 32, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Very steep slopes, solid rock generally, rising to SW. from 1,100 feet upwards, of no agricultural value, timber scrubby fir, of no timber value, some grazing in places.

SEC. 33, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land and steep slopes, solid rock showing in a few places, of no agricultural value, soil light clay and some gravel, thinly covered with bull pine and fir from 10 to 30 inches, of some timber value, fair grazing.

Tp. 19, R. 14, W. 6th Mer. *A. V. Chase, D.L.S., 1910.*

SEC. 1.—Nearly all over 4,000 feet above sea-level, high, broken and rocky, timber small jack pine to 6 inches, with some scattered bull pine in south $\frac{1}{2}$, poor grazing, no agricultural value.

SEC. 2.—From 3,400 to over 4,000 feet above sea-level, very broken, with stony outcrops, no agricultural value, the south and southwesterly portion contains bull pine to 20 inches, of doubtful lumber value, changing to dense growth of small jack pine in northeast, dry, light loam soil in extreme southwest, fair grazing in south and west.

SEC. 3.—From 2,855 to 3,800 feet above sea-level, fair timber value in bull pine and fir to 24 inches, fair grazing, light loam soil on very rolling and broken land, would say of no farm value.

A. J. Campbell, D.L.S., 1909.—SEC. 4, NE. $\frac{1}{4}$, PART SE. $\frac{1}{4}$.—Bench land and steep slopes to east, gentle slopes on west, from 1,050 to 1,660 feet above river, rough and broken on east boundary, suitable for cultivation on lower slopes, very dry, requires irrigation, soil light clay, some gravel and solid rock to east, bed of creek in SE. $\frac{1}{4}$, bull pine, fir and some jack pine to 15 inches, very scattered, of some timber value, land 20 per cent farm value, fair grazing.

PART SW. $\frac{1}{4}$.—Bench land and low land near Monté creek, from 1,000 to 1,095 feet, of some value as farm land, soil, clay loam and gravel on hills, bull pine and fir to 10 inches, and small poplar and fir, of no timber value, land 20 to 50 per cent value as farm land, some grazing.

SEC. 5, NE. $\frac{1}{4}$.—Bench land, hilly from 1,060 to 1,200 feet above river, partially suitable for cultivation, very dry, requires irrigation, small lake to south side, bad water, soil light clay and gravel, some rock to NE., scattered bull pine and fir average 10 inches and small poplar and fir in places, land 15 to 30 per cent farm, some grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land, rough and hilly with low patches, steep rocky slopes along south and west, small pond poor water to east side, suitable for cultivation in small patches along north, soil light clay and clay loam, small fir 4 inches and a few bull pine on lower slopes, no timber value, land 20 to 50 per cent farm value, grazing poor.

SEC. 6, PART NE. $\frac{1}{4}$, PART NW. $\frac{1}{4}$.—Bench land and steep slopes to south, rocky in parts from 1,120 to 1,500 feet above river, rough and broken suitable for cultivation

on small benches, dry, requires irrigation, soil clay loam with some gravel and rock, fir of small size with a few bull pine of no timber value, land 15 per cent value as farm, fair grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Steep slopes broken with solid rock in many places, from 1,140 to 1,880 feet, of no agricultural value, soil clay loam and gravel, with solid rock, fir of small size, small poplar, of no timber value, fair grazing.

SEC. 7, PART NE. $\frac{1}{4}$, PART NW. $\frac{1}{4}$, PART SE. $\frac{1}{4}$.—Rolling bench land from 960 to 1,110 feet partially suitable for cultivation, very dry, difficult to irrigate, soil light clay and gravel, scattered bull pine and fir, 6 to 20 inches, small bushy fir and jack pine, of no timber value, land 25 per cent farm value, grazing poor.

SEC. 8, NW. $\frac{1}{4}$.—Rolling bench land, steep slope of hill to north from 960 to 1,145 feet, partially suitable for cultivation, very dry, difficult to irrigate, soil light clay, scattered bull pine and fir to 20 inches, small bushy fir and jack pine, of no timber value, land 25 per cent value as farm land, grazing poor.

SEC. 8, PART SE. $\frac{1}{4}$.—Rolling bench land, rocky hill to south, from 950 to 1,250 feet, partially suitable for cultivation, very dry, difficult to irrigate, soil light clay and some gravel, scattered bull pine and fir from 6 to 20 inches, small bushy fir and jack pine, of no timber value, land 25 per cent farm value, grazing poor.

SEC. 9 NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rolling bench land and steep slopes rising to east, from 1,050 to 1,180 feet above river, rocky to east, partially suitable for cultivation on lower slopes, very dry, difficult to irrigate, soil light clay, very scattered bull pine and fir, 6 to 30 inches, small jack pine in places, land 25 per cent value as farm land, fair grazing.

PART NW. $\frac{1}{4}$.—Bench land, rolling gently, from 950 to 1,180 feet, suitable for cultivation, Monté creek in NW. corner, ravine 50 feet deep, very dry, requires irrigation, soil light clay, very scattered bull pine and fir 6 to 25 inches of no timber value, land 35 per cent farm, fair grazing.

A. V. Chase, D.L.S., 1910.—SEC. 10.—From 2,900 to 3,800 feet above sea-level, very much the same as sec. 3, possibly a greater area of workable patches, small holding in north east $\frac{1}{4}$, 3 to 5 acres cultivated, homesteader makes living off his place by labour.

SECS. 11 and 12.—From 3,080 to over 4,000 feet above sea-level, workable soil in north halves mostly, but no available water, might be cultivated in small patches of 3 to 5 acres in gullies, loam soil, only poor grazing, mixture of small timber of all kinds in west halves, running into dense growth of small jack pine in south halves.

A. J. Campbell, D.L.S., 1909.—SEC. 13.—Gently rolling bench land, from 1,500 to 2,170 feet, greater part of section suitable for cultivation, soil clay loam and black loam, three small creeks in section with some water, thickly covered with small jack pine, fir, poplar and willow with clumps of fir up to 15 inches, not profitable timber value, land 25 to 50 per cent farm value, some grazing, NW. and SW. quarters, cancelled homesteads.

SEC. 14, SE. $\frac{1}{4}$.—Rolling bench land, from 1,600 to 1,900 feet, greater part suitable for cultivation, soil clay loam and black loam, thickly covered with small jack pine, fir, poplar and willow, with clumps of fir up to 15 inches, not profitable timber value, land 25 per cent to 50 per cent farm value, some grazing, cancelled homestead.

SEC. 16, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land from 900 to 1,320 feet, rough and broken to north with solid rock showing in a few places, partially suitable for cultivation, dry, difficult to irrigate, soil clay loam, thinly covered with bull pine and fir to 15 inches of some timber value, land 25 per cent farm, fair grazing.

SE. $\frac{1}{4}$.—Bench land and steep broken slopes rising to SE. from 1,150 to 1,550 feet, partially suitable for cultivation, very dry, difficult to irrigate, soil light clay and clay loam, scattered bull pine and fir from 6 to 30 inches, of some timber value, land 20 per cent farm, fair grazing.

SEC. 17, NE. $\frac{1}{4}$.—Monté creek across SW. corner, steep rocky slopes to west, gentler slopes from creek to east, from 650 to 1,045 feet, partially suitable for cultivation,

very dry, requires irrigation, soil light clay and gravel, very scattered bull pine and fir, scrubby, of no timber value, land 30 per cent farm, fair grazing.

NW. $\frac{1}{4}$.—Steep slopes rising from both sides of Monté creek, rock hill to west, steep slopes rising to rock hill to south with some bench land between suitable for cultivation, very dry, requires irrigation, from 550 to 870 feet, soil light clay and clay loam, very scattered bull pine and fir scrubby, of no timber value, land 15 to 35 per cent farm, fair grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Steep slopes rising from Monté creek, from 750 to 1,300 feet, very steep and rocky to west, rising to rock hill which covers greater part, bench land to west and north of SW. $\frac{1}{4}$ partially suitable for cultivation, dry, requires irrigation, soil light clay and clay loam, scattered, scrubby bull pine and fir to 15 inches of no timber value, fair grazing.

SEC. 18, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Rock hill covering greater part, from 560 to 1,500 feet, of no agricultural value, soil light clay, very scattered, scrubby bull pine and fir, of no timber value, some grazing in places.

SE. $\frac{1}{4}$ (W. $\frac{1}{2}$), SW. $\frac{1}{4}$.—Bench land, slopes rising to west and north, from 950 to 1,375 feet, rocky in parts and partially suitable for cultivation, very dry, requires irrigation, soil light clay, very scattered, scrubby bull pine and fir, of no timber value, land 15 to 25 per cent farm value, some grazing.

SEC. 19, NE. $\frac{1}{4}$.—Greater part of quarter covered by high rock hill, from 675 to 1,020 feet above river, worthless as farm land, rolling bench land to north and east suitable for cultivation, very dry, difficult to irrigate, soil light clay and gravel, very scattered, scrubby bull pine and fir, fruit land 30 per cent value, fair grazing.

NW. $\frac{1}{4}$.—Bench land, slope of rocky hill to east, deep ravine of Monté creek, some bench land to west suitable for cultivation, and a good level bench to south of creek, very dry, possible to irrigate from Monté creek, soil light clay, some gravel, scattered bull pine and fir, of no lumber value, land 30 per cent fruit value, fair grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Deep ravine of Monté creek through half section, very steep slopes to south, very rocky, from 440 to 1,375 feet, a few acres of bench land in NW. corner, soil light clay, very scattered, scrubby bull pine and fir, of no timber value, bench land 30 per cent fruit value, fair grazing in places.

SEC. 20.—Nearly all rough rocky hills, highest in NE. $\frac{1}{4}$, from 685 to 1,100 feet, a few acres of land suitable for cultivation in NW. corner and SW. corner, very dry, difficult to irrigate, soil light clay and gravel, scattered growth of bull pine and fir up to 20 inches, of no timber value, small bushy growth fir, pine and jack pine, land 20 per cent farm, fair grazing.

SEC. 21, SW. $\frac{1}{4}$.—Bench land, rough in places with solid rock showing considerable part suitable for cultivation, from 925 to 1,320 feet, low valley in NW. would make good farm land, very dry, difficult to irrigate, soil sandy clay and clay loam, scattered bull pine and fir to 20 inches, of not much value, small bushy fir and jack pine, land 15 to 35 per cent farm value, fair grazing.

SEC. 26, NW. $\frac{1}{4}$.—Deep ravine of small creek along east side with steep slopes rising to east and west, from 525 to 850 feet, some land suitable for cultivation along west boundary, soil sandy clay loam with some rock to east of creek, thinly covered with bull pine and fir, open to west, land 30 per cent farm value, fair grazing.

SEC. 28, PART NW. $\frac{1}{4}$.—Steep slope falling towards river, broken by gullies and ravines, from 170 to 700 feet, no land of agricultural value, soil light sandy clay, scattered fir and bull pine to 20 inches, of no timber value, fair grazing.

SEC. 29, PART NE. $\frac{1}{4}$, PART NW. $\frac{1}{4}$.—Steep slopes to south broken by gullies, from 170 to 605 feet above river, a narrow strip of land along foot of slope and to south of group, lot suitable for fruit, requires irrigation, soil clay loam and sandy clay loam, some solid rock on steeper slopes, scattered fir and bull pine to 20 inches and small bushy fir, poplar and pine, open spaces, land 20 per cent value as fruit, grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land and steep broken slopes from 225 to 980 feet above river, bench land suitable for cultivation in SW. part, dry, requires irrigation, slopes

very steep and rocky on east, soil sandy clay loam, scattered bull pine and fir to 20 inches, small bushy fir and pine, land 30 per cent fruit, fair grazing.

SEC. 30, PART NE. $\frac{1}{4}$, PART NW. $\frac{1}{4}$.—A narrow strip of bottom land on gentle slope to south of group lot, suitable for fruit, rough broken slope to south, soil clay loam, very scattered bull pine and fir to 20 inches, scrubby and small bushy fir, poplar and jack pine, bottom land 20 per cent value as fruit, fair grazing.

SEC. 30, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land and steep slopes from 185 to 685 feet above river, rough and broken by deep gullies along north, partially suitable for cultivation, very dry, difficult to irrigate, soil light clay, very scattered bull pine and fir 6 to 25 inches, no timber value, land 30 per cent fruit value, fair grazing.

R. D. McCaw, D.L.S., 1909, SEC. 31, SW. $\frac{1}{4}$ (FRAC.).—Open clay bench about 30 feet above the South Thompson river terminating at north in broken clay cliffs, much of land is workable and all is open, 50 per cent fruit land, irrigation needed which could be supplied from the river by pumping, Rev. G. Stewart is squatted on this piece of land.

SEC. 31, N. $\frac{1}{2}$; SEC. 32, NW. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Steep rocky slopes the south half of which is worthless, north half affords scant grazing and has a few scattering bull pine and fir.

A. J. Campbell, D.L.S., 1909, SEC. 34, PART NE. $\frac{1}{4}$, PART SE. $\frac{1}{4}$.—A small area of bottom land on gentle slope in north part, steep slopes broken by deep ravine of small creek with some bench land on top, from 100 to 800 feet above river, soil light clay loam and gravel partially open, a few scattered fir and bull pine to 10 inches of timber value, land 15 to 25 per cent fruit, grazing fair.

SEC. 35, PART NE. $\frac{1}{4}$.—Bench land from 250 to 825 feet above river, broken by deep ravine of creek in NW. part, greater part suitable for cultivation, soil sandy clay loam, scattered bull pine and fir up to 25 inches of some timber value, land 50 per cent value as farm land, fair grazing.

PART NW. $\frac{1}{4}$.—Steep broken slopes with some benches, from 200 to 750 feet above river, bench land in SE. part suitable for cultivation, soil light sandy clay loam, scattered bull pine and fir 6 to 25 inches of some timber value, land 25 to 50 per cent farm value, fair grazing.

SE. $\frac{1}{4}$.—Bench land from 750 to 1,000 feet above river, gently rolling, soil light sandy clay loam, scattered bull pine and fir 6 to 25 inches, of some timber value, land 50 per cent farm value, fair grazing.

SW. $\frac{1}{4}$.—Bench land from 325 to 850 feet above river, broken by deep ravine of creek, with steep slopes taking up greater part of quarter, part to NE. suitable for cultivation, soil clay loam and gravel, open to SW. scattered bull pine and fir up to 25 inches of some timber value, land 25 to 50 per cent farm value, fair grazing.

SEC. 36, NW. $\frac{1}{4}$.—Bench land, gentle slopes rising to north and south from creek in northern part, suitable for cultivation, soil sandy clay loam, some gravel, scattered bull pine and fir up to 20 inches and thick small fir, land 25 to 50 per cent farm value, fair grazing.

TP. 20, R. 14, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 1, NE. $\frac{1}{4}$.—Steep broken slopes to NW. part, some bench land to SE. suitable for cultivation, from 380 to 850 feet above river, soil sandy clay loam with gravel and small boulders in places, scattered bull pine and fir up to 25 inches, has been logged, not much timber of value, land 25 to 50 per cent farm value, fair grazing. In timber berth 436.

SEC. 1, PART NW. $\frac{1}{4}$.—Bottom land on gentle slopes to NW. part, steep broken slopes to SE., from 125 to 700 feet above river, very dry, requires irrigation, soil sandy clay loam and clay loam, open on bottom land scattered bull pine and fir to 20 inches no timber value on slopes, land 30 per cent fruit value.

PART SW. $\frac{1}{4}$.—Bench land to south suitable for cultivation, steep slopes broken to north and west from 390 to 700 feet above river, soil sandy clay loam and some

gravel, very scattered bull pine and fir up to 20 inches scrubby, no timber value, land 30 per cent farm value, fair grazing.

SEC. 2, PART SE. $\frac{1}{4}$.—Small area bottom land on gentle slope to north and west, steep slopes rising to south, and small area of bench land along south from 110 to 705 feet above river, dry, requires irrigation, soil sandy clay loam and clay loam, open in parts scattered bull pine and fir up to 20 inches, scrubby of no timber value, bottom land 30 per cent fruit, bench land 25 per cent farm, fair grazing.

R. D. McCaw, D.L.S., 1909.—SEC. 3, NW. $\frac{1}{4}$ (FRAC.), NE. $\frac{1}{4}$ (FRAC.).—Part is flat bench land, some of it broken by clay cliffs, the NW. corner is sloping land rising to NW., altitude 250 to 450 feet above the South Thompson river, soil a light clay and loam, some scattering fir and bull pine, 50 per cent fruit land, irrigation is difficult to obtain.

SEC. 4, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Gentle rolling open land with part having rather steep slope and part broken, 250 to 915 feet above the South Thompson river, soil sandy and clay loam, stony in places, some scattering fir and bull pine with much open land, 25 to 50 per cent fruit value, irrigation difficult to obtain.

SE. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Broken bench land, 200 feet above the South Thompson river, soil light clay and loam, sometimes stony, fir and bull pine scattering to 20 inches, much has been cut off, small areas of 50 per cent fruit land, irrigation difficult to obtain.

SEC. 5, SE. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Rough slopes rising to NW., 465 to 750 feet above the South Thompson river, soil sandy loam, stony in places with outcrops of rock, generally open with a few scattering bull pine and poplar clumps 25 per cent fruit land, needs irrigation which is difficult to obtain.

NW. $\frac{1}{4}$.—Generally rough rocky slope, with area of workable land in NE. corner, 750 to 1,400 feet above the South Thompson river, soil sandy loam with black loam 6 inches, and clay loam subsoil in places, parts stony, generally open land with scattered clumps of scrubby fir, bull pine and poplar, NE. part 50 per cent farm value, rest is grazing land, irrigation is difficult to obtain.

SEC. 5, SW. $\frac{1}{4}$; SEC. 6, (WHOLE SEC.).—Rough rocky broken slopes of no agricultural value, 300 to about 2,000 feet above the South Thompson river, soil sandy loam, very stony, much open land with scattered fir and bull pine to 30 inches of possible value in sec. 6, all has fair grazing value.

SEC. 7, SW. $\frac{1}{4}$.—Depression runs northerly through this quarter with broken slopes on each side, 1,600 to 2,000 feet above the South Thompson river, soil much black loam 6 inches with stony clay subsoil, fir and bull pine scattering to 24 inches with smaller birch and poplar, 50 per cent farm land does not need irrigation, Mr. Hazelhurst has been squatted on this quarter for a few years and has made improvements.

SEC. 7, N. $\frac{1}{2}$; SEC. 8, NW. $\frac{1}{4}$.—Generally workable slopes falling to east, broken in places, 1,200 to 2,130 feet above the South Thompson river, soil sandy loam, stony usually with black loam in places, some open land but generally scattering fir and bull pine to 30 inches diameter with some poplar clumps, 25 to 50 per cent farm land, irrigation likely needed and difficult to obtain.

SEC. 8, SE. $\frac{1}{4}$.—Rolling slopes with a few rocky knolls, much workable land in depressions, 915 to 1,200 feet above the South Thompson river, soil sandy loam with black loam in depressions, stony in places, open land generally with scattering clumps of fir, bull pine and poplar, 50 per cent farm land, doubtful if irrigation is necessary. John Smith is squatted on this quarter and has entry on NE. $\frac{1}{4}$ sec. 5.

SEC. 9, NE. $\frac{1}{4}$; SEC. 10, NW. $\frac{1}{4}$.—Gently rolling land with south part broken, small knolls, 345 to 925 feet above the South Thompson river, soil clay and sandy loam, often stony, black loam appears in many places, open land with some scattered scrubby fir and bull pine, parts have 40 per cent value as fruit land, and parts 50 per cent value as farm land, irrigation likely needed but difficult to obtain.

SEC. 10, SW. $\frac{1}{4}$, NE. $\frac{1}{4}$ (W. $\frac{1}{2}$), SE. $\frac{1}{4}$ (FRAC.).—Generally sloping to South Thompson river, broken in places, 270 to 670 feet above that river, soil clay and sandy loam usually rather stony and gravelly, scattering fir and bull pine to 18 inches diameter, 25 to 50 per cent fruit land, irrigation needed and difficult to obtain.

A. J. Campbell, D.L.S., 1909.—SEC. 12, SE. $\frac{1}{4}$.—Small area bottom land in NW. corner, bench land and steep slopes, partially suitable for cultivation, dry, requires irrigation, from 125 to 665 feet above river, soil sandy clay loam and gravel, open to NW., very scattered bull pine and fir to 20 inches, good part has been logged, not much timber value, fair grazing, fruit land 15 to 30 per cent value, in timber berth 436.

R. D. McCaw, D.L.S., 1909.—SEC. 13, LEGAL SUB. 13; SEC. 14, NE. $\frac{1}{4}$.—Steep slopes, rocky and broken, 650 to 970 feet above the South Thompson river, black sandy clay with much rock and stone, open with scattered scrubby fir and bull pine, fair grazing value.

SEC. 14, NW. $\frac{1}{4}$; SEC. 15, NE. $\frac{1}{4}$.—Rolling open slopes with much workable land, 600 to 1,000 feet above the South Thompson river, soil light sandy clay with black loam in many of the depressions, stony, south part has parts of 30 per cent fruit value, north part 40 per cent farm value, irrigation needed, but difficult to obtain.

SEC. 16, NE. $\frac{1}{4}$.—Rolling open land with many knolls, much of land is workable, 1,050 to 1,225 feet above the South Thompson river, soil sandy loam with much black loam in places, stony, 40 per cent farm land, irrigation likely needed but difficult to obtain.

SE. $\frac{1}{4}$.—Gentle rolling land, open, 850 to 1,100 feet above the South Thompson river, soil, sandy loam with much black loam in places, stony, 50 per cent farm land, irrigation likely needed but difficult to obtain.

SW. $\frac{1}{4}$.—Rolling land broken in places, open, with scattered bull pine and fir to 16 inches in SW. corner, much black loam with sandy loam subsoil, stony, 50 per cent farm land, irrigation is difficult to obtain.

SEC. 17, SW. $\frac{1}{4}$.—Rolling land, 1,400 to 1,650 feet above the South Thompson river, sandy loam, stony with much black loam, east part open, west part has fir and bull pine to 24 inches diameter, of good value, 30 per cent farm land, irrigation likely needed but difficult to obtain.

NW. $\frac{1}{4}$.—Slopes rise to the north, 1,500 to 2,000 feet above the South Thompson river, soil, sandy loam, stony and rocky in parts, fir and bull pine to 24 inches of fair value, north half is grazing land with timber value, south half is 30 per cent farm land, irrigation difficult to obtain.

SEC. 18 (WHOLE SEC.).—Rolling land sloping from NE. to SW. to small stream running through the section, slopes in places along stream are steep 1,600 to 2,131 feet above the South Thompson river, soil sandy loam, stony with black loam in places, a few open spaces exist but land is generally covered with fir and bull pine to 24 inches diameter and of good value, whole section ranges from 25 to 50 per cent value as farm land, irrigation might be supplied in part from Paul creek.

SEC. 19, SW. $\frac{1}{4}$.—Rolling slope, 1,805 to 2,050 feet above the South Thompson river, sandy loam soil, rather stony, fir and bull pine to 24 inches with smaller poplar, jack pine and birch, likely timber value, 25 per cent farm land, irrigation might be supplied from Paul creek, if needed.

SEC. 19, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 20, SW. $\frac{1}{4}$.—Rolling slopes rising in steep slope to NE., much rock in places, altitude 2,000 to over 2,500 feet above the South Thompson river, sandy loam soil, very stony in places, lower slopes are workable but too high for successful cultivation, fir and bull pine to 24 inches diameter with small poplar, jackpine and birch, fair timber value, grazing throughout.

SEC. 20, SE. $\frac{1}{4}$; SEC. 21, SW. $\frac{1}{4}$.—Rolling slopes with many knolls and rising steeply in SE. $\frac{1}{4}$ of sec. 20, altitude 1,225 to 2,500 feet above the South Thompson river, soil sandy loam, stony, rocky in parts, fir and bull pine scattered to 24 inches diameter, some open land in SE. corner of SW. $\frac{1}{4}$ of sec. 21, fair grazing land.

SEC. 22, S. $\frac{1}{2}$.—Rolling land with many knolls, much of land workable, altitude from 900 to 1,200 feet above the south Thompson river; soil, sandy loam, stony, with black loam in places; scattered bull pine and small poplar clumps, 25 per cent value; needing irrigation, which is difficult to obtain.

SEC. 23, S. $\frac{1}{2}$.—Rough slopes, hilly with workable land in valleys 915 to 1,260 feet above the South Thompson river, black loam in valleys and sandy loam on slopes, stony, rock outcrops in places, open land in valleys with scattering fir and bull pine on slopes and on tops of hills, enough workable land to give farming value of about 25 per cent, irrigation if needed is difficult to obtain, grazing throughout.

SEC. 23, N. $\frac{1}{2}$; SEC. 24, NW. $\frac{1}{4}$ (W. $\frac{1}{2}$), SW. $\frac{1}{4}$, NE. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Hilly and broken, many steep slopes, altitude rises from 230 feet in SW. $\frac{1}{4}$ of sec. 24 to over 1,500 feet in north part of sec. 23, above the South Thompson river, stony loam with many outcrops of rock, scattering scrubby growth of fir and bull pine of possible value, good grazing generally.

R. D. McCaw, D.L.S., 1910.—(FRACTION UNEXAMINED IN 1909.)

This part consists of the two north tiers of sections with the north halves of sects. 20, 21 and 22. In general it is of semi-mountainous character, but some of the valley contains land which might be of value agriculturally. In the south part of the township the lands were examined in 1909 and conditions reported. The lands disposed of in the north part have been homesteaded recently and no results in agriculture as yet obtained. However, the soil in the north half of sec. 31 should be very productive, as it is a rich loam in the valley land therein.

SEC. 20, N. $\frac{1}{2}$.—Rather steep broken slopes, often rocky, rising to 3,830 feet above sea-level, fair fir to 36 inches diameter, rather scattering, some scrub, fair grazing.

SEC. 21, NE. $\frac{1}{4}$; SEC. 22, N. $\frac{1}{2}$.—Broken slopes, useless for cultivation, gravelly and sandy loam, generally open, with scattering bull pine and fir to 24 inches, scant to fair grazing value.

SEC. 25, S. $\frac{1}{2}$; SEC. 26, S. $\frac{1}{2}$.—Steep, rocky rise towards north, 2,035 to about 3,000 feet above sea-level, useless for cultivation, much open land with thinly scattered fir and bull pine to 30 inches, some poplar and willow scrub; good grazing.

SEC. 25, N. $\frac{1}{2}$; SEC. 36.—Steep slope falling from a high hill in sec. 35 and ending in broken hills to the northeast of sec. 36, rock slides in places, useless for agriculture, 1,900 to about 3,500 feet above sea-level, dense growth generally, consisting of small cedar, poplar, alder and willows with windfall, scattering fir and bull pine to 24 and 30 inches, of possible lumber value, some jack pine and cedar to 15 inches, poor to fair grazing.

SEC. 26, N. $\frac{1}{2}$; SEC. 35, S. $\frac{1}{2}$.—Slopes falling from a ridge in east part and rising towards a ridge west of this area, much of land is workable, light sandy loam, some steep slopes, 3,000 to 3,700 feet above sea-level, very doubtful farm value, fir scattering to 20 inches diameter, a few jack pine to 12 inches, dense willow, birch, poplar and alder scrub, windfalls in parts, fair grazing.

SEC. 27, N. $\frac{1}{2}$.—Rolling, broken slopes rising to stony hilltop to the north over 3,600 feet in altitude, sandy loam, very stony, useless for agriculture, fir to 30 inches, some bull pine, poplar and willows, good grazing.

SEC. 27, S. $\frac{1}{2}$; SEC. 28, E. $\frac{1}{2}$.—Exceedingly broken valley with steep broken slopes east and west, much of land below 3,000 feet above sea-level, useless for cultivation, areas of open land with a few scattering fir and bull pine, and clumps of poplar, willows and birch; fair grazing.

SEC. 28, W. $\frac{1}{2}$; SEC. 29; SEC. 30, E. $\frac{1}{2}$; SEC. 31, SE. $\frac{1}{4}$ (S. $\frac{1}{2}$); SEC. 32, S. $\frac{1}{2}$ (EXCEPT LS. 5); SEC. 33, SW. $\frac{1}{4}$.—This area is composed of slopes rising towards a high hill in sec. 29, in south $\frac{1}{2}$ of sec. 32 and southwest $\frac{1}{4}$ of sec. 33 precipitous rock cliffs occur, some open land occurs in east $\frac{1}{2}$ of sec. 28, altitude of area is from 2,760 to nearly 4,000 feet above sea-level, some workable slopes occur in parts but owing to altitude and impossibility of irrigation are unfit for farm value, with the exception of the east $\frac{1}{2}$ of sec. 28 all is thickly wooded, much scrub growth of various kinds, some jack pine on higher slopes and windfalls, fir occurs throughout 18 inches diameter and some larger, with a few bull pine on some of lower slopes, poor to fair grazing.

SEC. 30, NW. $\frac{1}{4}$; SEC. 31, SW. $\frac{1}{4}$, LS. 7, 8; SEC. 32, LS. 5.—Gently rolling slopes falling north westerly and containing much workable land, 3,200 to 3,550 feet above sea-

level, sandy loam with much rich dark loam, apparently of value if altitude does not interfere, much scrub growth with some open patches, fir to 20 inches, some spruce to 18 inches, jack pine to 12 inches, timber is likely of value, fair grazing.

SEC. 32, NE. $\frac{1}{4}$.—Valley east and west through centre, fair proportion workable, 3,290 to 3,645 feet above sea-level, sandy loam, some dark loam, land is broken to north and south, fir to 18 inches frequent, some spruce and much small growth, fair grazing, possible farm value.

SEC. 33, N. $\frac{1}{2}$, SE. $\frac{1}{4}$.—Hill side rising to the northeast, parts broken and rocky, altitude about 3,000 to over 3,715 feet, sandy loam, parts workable, but on the whole of no agricultural value, much scrub poplar, willow, alder, etc., with some cedar and spruce, much jack pine on higher slopes, fir to 18 inches scattered, and a few bull pine, poor to fair grazing.

SEC. 34.—Ridge running from southeast to northwest divides the section into two slopes, west slope is much broken and steep, east slope is fairly gradual and much is workable in the north $\frac{1}{2}$ of section, altitude rises to 3,700 feet above sea-level altitude of workable slopes in north $\frac{1}{2}$ is about 3,500 to 3,600 feet, soil is a rich brownish loam value agriculturally, doubtful owing to altitude, irrigation would likely be necessary generally a dense scrub growth of alders, poplar, willows, some cedar and windfalls, jack pine to 12 inches, some fir to 30 inches, no grazing value.

SEC. 35, N. $\frac{1}{2}$.—Composed mainly of a steep rocky hill falling to the north, east and west, growth mainly thick scrub, some scattering fir to 18 inches and a few cedar northwest part of northwest $\frac{1}{4}$ has probable farm value being similar to northeast $\frac{1}{4}$ of sec. 34, slope here is more gradual, no grazing.

Tp. 21, R. 14, W. 6th Mer. *R. D. McCaw, D.L.S., 1910.*

This township forms the southeast part of the Niskonlith Forest reserve. The surface is of a more or less mountainous character and the slopes usually steep, A dense scrub or timber growth covers the entire area. Two main valleys occur, that of Niskonlith creek and those of Louis creek and Gulch creek which join to form one long valley from the southeast to the northwest part of the township. A great deal of the area is under 4,000 feet in altitude, and much below 3,500, but slopes are usually so steep in agricultural altitudes as to not admit of cultivation.

SECS. 1 AND 2.—The valley of Gulch creek runs through the south halves of these sections, steep and broken slopes, often rocky fall to it on both sides, altitude is 2,000 to about 3,500 feet above sea-level, much small scrub poplar, alders and willows with windfall, fir and bull pine to 18 inches, some to 30 inches in scattering quantity, some cedar and spruce in valley bottom, poor to fair grazing, LS. 4 in sec. 2 has a small area that could be cultivated but is too small for value.

SEC. 3.—Valley of Gulch creek from northwest to southeast, steep slopes fall to it from northeast and rise to southwest, for short distance becoming more gradual and workable, the southwest $\frac{1}{2}$ of section has much workable land of brownish sandy loam, usually good, 2,510 to 3,665 feet above sea-level, doubtful value owing to altitude and would probably need irrigation, rather scattering growth of bull pine and fir northeast of valley, with much scrub, dense growth of all kinds of scrub to the southwest with windfalls and some scattering fir, cottonwood and cedar to 36 inches, no grazing value in southwest $\frac{1}{2}$, poor to fair grazing in northeast $\frac{1}{2}$.

SEC. 4.—Rough, rolling slope of hilly nature rising to over 4,000 feet above sea-level, no agricultural value, dense growth of scrub including balsam, fir, spruce, alder, willow and jack pine, some jack pine to 9 inches diameter, fir to 24 inches, and some balsam and spruce to 15 inches, windfalls, grazing is poor to fair.

SECS. 5, 6, 7 AND 8.—Generally hilly and broken, with slopes rising north and northwest, much of land rocky, 3,400 to over 4,000 (N. $\frac{1}{2}$ of sec. 7) feet above sea-level, average altitude about 3,600 to 3,800 feet, no agricultural value, thickly timbered throughout, much scrub growth of all kinds and a great deal of windfall, jack pine to 10 inches diameter, fir to 20 inches and some to 24 and 30 inches, a few balsam in

parts to 14 inches, following lands have possible timber value, S. $\frac{1}{2}$ of sec. 5, SW. $\frac{1}{4}$ of sec. 6, grazing is usually poor.

SEC. 9.—Gulch creek valley from northwest to southeast, slopes usually steep on each side, no agricultural value, very stony, altitude rises to over 4,000 feet in southwest part, much scrub growth of all kinds, fir to 18 inches diameter and running to 36 inches in a few cases, poor timber value, much jack pine to 12 inches, and windfalls, grazing of very poor value.

SEC. 10.—Rising to northeast in steep, broken and rolling slopes to over 4,000 feet above sea-level, no agricultural value, much scrub growth with scattering fir and some bull pine to 36 inches, of possible value, some jack pine on higher slopes, usually poor grazing.

SEC. 11.—Steep slopes and broken, often rocky, 3,140 to over 4,000 feet above sea-level, no agricultural value, thick scrub alder, jack pine and willows, with much windfall, a few fir running to 30 inches sometimes, some balsam, spruce and cedar to 14 inches, brulé in parts, poor to fair grazing.

SEC. 12.—Steep, broken slopes falling east to Niskonlith creek in northeast part and rising again to northeast corner, much rock and many boulders, useless for cultivation, 2,055 to 3,570 feet above sea-level, west $\frac{1}{2}$ has some fir to 16 inches diameter, small cedar and jack pine, with thick scrub, no timber value, east $\frac{1}{2}$ has probable value in fir and cedar to 36 inches, much small scrub growth, very poor grazing.

SEC. 13, S. $\frac{1}{2}$; NE. $\frac{1}{4}$.—Steep broken slopes, rocky, falling to Niskonlith creek, 2,530 to 3,570 feet above sea-level, no agricultural value, much scrub growth, with some fir to 20 and 24 inches, some jack pine, a few spruce and some cedar along creek, poor grazing.

SEC. 13, NW. $\frac{1}{4}$; SEC. 14, N. $\frac{1}{2}$; SEC. 24, SW. $\frac{1}{4}$; SEC. 23, S. $\frac{1}{2}$.—Gently rolling land with sandy loam soil, with some rich dark loam in parts, and mostly free from stones, 3,100 to 3,500 feet above sea-level, seems of fair agricultural value, parts may need irrigation which Niskonlith creek could supply, timbered with balsam, fir and spruce to 20 inches and occasional 24 inches, thick scrub and windfalls, timber is of probable value.

SEC. 14, S. $\frac{1}{2}$.—Rolling, much workable land of doubtful value owing to altitude, 3,500 to over 4,000 feet above sea-level, sandy loam, stony, north part of southwest $\frac{1}{4}$ of probable value, thick scrub growth with some fir to 24 inches and larger, very little grazing.

SEC. 15, E. $\frac{1}{2}$.—Much workable rolling land, 3,315 to 3,800 feet above sea-level, altitude makes value doubtful, sandy loam, stony, fir, balsam and spruce to 20 inches, some cedar and much small scrub, large area of possible farm value, would likely need irrigation.

SEC. 15, W. $\frac{1}{2}$; SEC. 16.—On rolling slopes rising to the north, often rough and broken, 2,980 to over 3,700 feet in altitude, no agricultural value, mainly scrub growth and very dense, alders, willows with jack pine and spruce in places, some fir to 24 inches with a few small spruce and cedar, poor to fair grazing, sec. 16, L.S. 12, has a small area of workable sandy loam covered with dense growth.

SEC. 17, NE. $\frac{1}{4}$.—Some land in bottom of Louis creek of fair value then becoming broken, with some steep slopes on each side, sandy loam, stony, 2,965 to 3,300 feet above sea level, dense poplar, willow, alder, cedar and spruce scrub, some fir and cedar to 20 inches, with irrigation the bottom land should prove of farm value, poor grazing.

SEC. 17, S. $\frac{1}{2}$, NW. $\frac{1}{4}$; SEC. 18; SEC. 19, W. $\frac{1}{2}$, SE. $\frac{1}{4}$.—Land broken and steep rising to the southwest of Louis creek in mountain slopes to over 4,000 feet above sea-level, there is no possible farm value, growth is mainly thick small scrub overgrowing an old time brulé, some fir of lumber size exist, but very few, jack pine occurs in large patches in parts, much windfall, some small spruce and balsam, grazing is of practically no value, south $\frac{1}{2}$ of sec. 17 has timber of fair value.

SEC. 19, NE. $\frac{1}{4}$; SEC. 20, L. S. 12, SW. $\frac{1}{4}$, L. S. 2.—Some workable land in immediate vicinity of Louis creek, dry sandy loam, some dark loam, altitude 2,900 to 3,100

feet above sea-level, would probably need irrigation, steep slopes rise on each side, much scrub alder, poplar, and willow on steep slopes with a few fir, spruce and balsam on lower slopes and in bottom of valley, areas of workable land small and of doubtful value, poor grazing, with no value in parts.

SEC. 20 (REMAINDER); SEC. 21; SEC. 22, W. $\frac{1}{2}$, NE. $\frac{1}{4}$; SEC. 29, SW. $\frac{1}{4}$.—Rising to north in steep slopes in secs. 20 and 21 and gentle slopes in 22, to over 4,000 feet above sea-level, no agricultural value, parts workable are too high, being over 3,600 feet in altitude, growth generally scrub alder, jack pine, willow, with some fir, spruce and balsam to 20 and 24 inches in parts, of little use for grazing.

SEC. 22, SE. $\frac{1}{4}$.—Gently rolling slopes, 3,365 to 3,810 feet above sea-level, parts broken, sandy loam, possible agricultural value in lower altitudes, fir, balsam and spruce to 20 inches, a few small cedar, much scrub, grazing is of very poor variety.

SEC. 23, N. $\frac{1}{2}$; SEC. 24, NW. $\frac{1}{4}$.—Usually gently rolling slopes, sharp in places sandy loam with some dark loam, Niskonlith creek flows through northeast $\frac{1}{4}$ of sec. 23, altitude 3,215 to over 3,800 feet, a good deal of land is below 3,500 feet, agricultural value is very doubtful, owing to altitude, much good lumber, spruce, balsam and fir to 30 inches, small birch, willows and jack pine, with windfalls, no grazing value.

SEC. 24, E. $\frac{1}{2}$.—Parts workable slopes, but much broken and rocky, 3,105 to 3,800 feet above sea-level, small area in L. S.'s 2 and 7, of possible value, dense scrub in parts, much willow, jack pine, and small fir windfalls, poor grazing.

SECS. 25 to 28; SEC. 29, E. $\frac{1}{2}$, NW. $\frac{1}{4}$; SECS. 32, 33, 34, 35, 36.—There is no agricultural land in this area, altitude from 3,600 to 5,000 feet above sea-level, slopes are often gently rolling and again steep and broken with a general rise to the north, densely timbered mainly with jack pine usually of small dimension but sometimes to 20 inches diameter, some spruce and balsam, and much small scrub growth and windfall, some fir on lower slopes, secs. 25, 26 and 36 have much balsam and spruce to 24 inches, with some cedar, timber is of value commercially.

SEC. 30.—Louis creek flows from southeast to northwest between steep slopes rising to over 4,000 feet above sea-level, some land along bottom of valley 2,830 to 3,000 feet in altitude, of possible farm value, usually a dry sandy loam, slopes are covered with scrub growth overgrowing old brulé, some patches of, and some scattering fir, spruce, and balsam, bottom of valley has fair growth of timber, windfalls common, grazing poor, southwest $\frac{1}{4}$ has no agricultural value, and northeast $\frac{1}{4}$ only a small area in L. S. 10.

SEC. 31, SW. $\frac{1}{4}$.—Part workable near Louis creek in southwest corner, then rising steep and broken to 3,750 feet, altitude of creek is 2,830 feet above sea-level, soil dry sandy loam needing irrigation, fir to 20 inches, some spruce to 14 inches, much brulé and scrub, some grazing.

SEC. 31, N. $\frac{1}{2}$, SE. $\frac{1}{4}$.—On steep mountain slopes rising to over 5,000 feet, well timbered with fir to 30 inches, becoming more scattering in southeast $\frac{1}{4}$, good lumber value, scrub and jack pine, some brulé, poor grazing.

Tp. 22, R. 14, W. 6th Mer. *R. D. McCaw, D.L.S., 1910.*

This township is mountainous in character, and has three high hills, Mount Tod in the northwest, another knoll in the east rising to an altitude of about 6,000 feet, and another between 5,000 and 6,000 feet in the south part. Mount Tod has its summit in secs. 30 and 31 and slopes east to a pass through secs. 20, 21, 28 and 33 and south to McGillvray creek which flows through secs. 16, 17 and 18 from a lake in sec. 15. The slopes are steep and not workable in agricultural altitudes. Secs. 29, 30, 31 and 32 have a great deal of open land with a good growth of grass. There are some spruce and balsam in places also with some scrub and jack pine. Secs. 18, 19 and 20 are all on steep slopes covered chiefly with scrub willows, poplar and alder with some jack pine and a few groves of spruce and balsam. A few scattering fir occur on the lower slopes in places. The westerly part of secs. 6 and 7 has a similar growth with more fir to 20 inches diameter. Evidence of old brulé occurs in most places showing that large timber had once grown. Secs. 32, 33 and 34 have a fall to the upper part of

Cahilty creek. Altitudes vary from 4,400 feet to over 5,000 feet in secs. 32 to 34. Some workable slopes occur along McGillvray creek with an altitude of 3,900 feet and upwards but from local information these areas are much too high for agricultural value.

Secs. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 21, 22, 23, 24, 25, 26, 27, 28, 33, 34, 35 and 36 are all covered with a dense growth of green timber including jack pine, spruce, balsam and some cedar in depressions. A few small open brûlé areas occur especially in secs. 5, 6, 7 and 8. The jack pine grows to 10 or 12 inches in diameter and is rarely larger. Spruce and balsam are found mainly in depressions and vary in diameter being sometimes 18 and 20 inches. On the east side slopes through secs. 1, 12 and 13, the growth is very dense, and on the east slopes generally in that part of the township. Balsam occur in places to 24 inches diameter but are scattering. Alders, willows, and jack pine grow in an almost impenetrable tangle.

Windfalls occur all through in more or less quantity.

Pine grass grows in rather scant quantity.

Tp. 24, R. 14, W. 6th Mer. *A. O. Wheeler, D.L.S., 1909.*

PART SEC. 36.—Narrow strip of bottom land along creek, rising 300 feet above lake, very gentle to steep slopes forming sides of the valley, may be classed as fruit land of 50 per cent to 80 per cent value north of and adjacent to creek, and 25 to 30 per cent value to south steep slopes of valley. Soil along creek dark and reddish sandy and clay loam with a few stones and fine gravel, gets more stony near steep slopes on north side and very stony and rocky as steep slopes on south side are approached. Timber along creek, good cedar to 40 inches diameter and fir to 20 inches of lumber value, elsewhere good scattering of fir to 20 inches and cedar to 15 inches of lumber value, also smaller growth of fir, birch, cedar, poplar, spruce, maple, alder and willow, poplar and willow near steep slopes, thick undergrowth along creek, on north side steep slopes and openly clad with scrubby fir with rock showing frequently, and on south side with second growth and scattered bunches of fir.

Tp. 25, R. 14, W. 6th Mer. *A. O. Wheeler, D.L.S., 1909.*

SEC. 1, Pt. SE. $\frac{1}{4}$ Pt. NW. $\frac{1}{4}$.—On south side Pass creek a small corner of bottom land in SE. $\frac{1}{4}$, on north side, gentle ascent to steep slopes of valley 400 feet above lake, classed as fruit land of 25 per cent near north steep, slopes to 50 per cent value. Soil light yellowish and reddish sandy loam with gravel and stones, very stony near north slopes. Timber cedar to 40 inches diameter and fir to 20 inches diameter along creek, elsewhere scattering fir to 18 inches diameter of lumber value and small cedar, fir, birch and undergrowth, small poplar, willow and birch along margin of north steep slopes. These steep slopes are not suited for agriculture but are thickly timbered with scrubby fir and spruce. There is an old shack on the line between north and south halves of sec. 1 close to the $\frac{1}{4}$ sec. post on west boundary. Close by is a fine bunch of excellent cedar, part of which is on NW. $\frac{1}{4}$ of section.

Tp. 16, R. 15, W. 6th Mer. *A. V. Chase, D.L.S., 1910.*

All of the north $\frac{1}{2}$ of this township with the exceptions of secs. 23 to 26 is practically the same as township 17, range 15 described below, being great rolling rocky hills rising to over 4,000 feet above sea-level, and covered with small growth of jack pine on burnt over soil. No grazing of value.

SEC. 23 TO 26.—From 3,000 to over 4,000 feet above sea-level, some small timber value appears in these sections, small stretches of fir begin to appear as one approaches Salmon river, fir as yet is small, to 16 inches diameter but may increase to lumber value in 30 years, some fair grazing here, land is almost altogether rolling and in some cases very steep, it would not be possible to find a stretch of sufficient area level enough for cultivation, also there is no possibility of irrigation, a great deal of small jack pine with occasional bull pine to 18 inches diameter.

*C. H. Taggart, D.L.S., 1911.—(Ranges 15 to 17).—*The point of commencement for this work is easily reached from Napier lake on the main Nicola road by following a settlers' trail which leads to Palmer's meadows in the northern part of township 16, range 16. An alternative route would be the main Nicola road to Stump lake and from there a good wagon road leads along Fraser creek to James Eriskin's ranch in section 34, township 16, range 17, and thence to Palmer's meadows. From Palmer's meadows pack horses had to be employed to transport our camps and a pack-trail was cut out to connect with the Salmon River road. The country in sections 25, 26, 35 and 36, township 16, range 17, is rolling and is mostly good grazing land. The southwest quarter of section 35 is cultivated. From the northeast corner of section 21 (which is the southwest corner of the Monté Hills reserve) easterly, the country becomes very rough and rocky and is thickly timbered with jack pine and some scattered fir and balsam. No land suitable to agriculture was noticed and the timber is of no commercial value. Deer and grouse were the only game seen. There is no hay, water-powers, minerals nor stone-quarries.

Tp. 17, R. 15, W. 6th Mer. *A. V. Chase, D.L.S., 1910.*

The entire area is useless agriculturally, being all over 4,000 feet except a small portion in southeast part, and rises to over 5,000 feet above sea-level. Surface is composed of rocky hills of mountainous character and generally covered with a dense impenetrable growth of small jack pine, usually smaller than 10 inches in diameter. A few spruce exist in damp portions. Many bare rock slopes appear in the east part. The township is the source for a few small streams and has a value for conserving water supply. A few lakes occur in the southwest part.

*(Monté Hills Forest reserve.)—*This reserve comprising township 17, range 15, the west half of township 17, range 14, the east half of township 17, range 16, the north half of township 16, range 15, the northwest quarter of township 16, range 14, and sections 24, 25, 26, 27, 34, 35 and 36 in township 16, range 16, consists of a great tract of useless land. Only one small area in the northwest corner was found with possible value for hay growing. Several small meadows of wild hay occur along the west boundary to the south of the reserve. Timothy hay was attempted here and never reached a height of over six inches or thereabouts. Probably seventy-five per cent of the whole area is composed of high rock hills reaching an altitude of 5,280 feet above sea-level, and covered more or less with great forests of small jack pine and stretches of old burn. On the eastern side, running from north to south, is a valley in which are situated some hay meadows, but they are only fit for wild hay. No land was found which could be profitably cleared and cultivated. The only timber of value commercially was seen on the extreme northwest and southeast parts, and there was probably not more of it than covered 4 square miles. In these areas the timber is mainly fir with a few scattered bull pine. Considerable grazing value is found in the valley through the eastern part and evidences of this being used for ranching purposes were noted. Stock-yards, corrals and old log shacks and sheds were found. The grazing in the bottom lands is good in general and the wild hay on the meadows of fair growth. Of the land to the north of the reserve not included in the examination under the direction of A. O. Wheeler, D.L.S., in 1909, that immediately to the north of the reserve is very similar to the lands within in. About two-thirds of the land in township 18, range 15, in this part is over 4,000 feet above sea-level, and is composed of rock hills covered with jack pine scrub and thickets. To the north the rock is covered with shallow soil; a few bull pine, small fir and spruce appear in gullies, but there is no agricultural nor timber value. Grazing generally is poor. In township 18, range 14, the general elevation is not so high, but the surface of the ground is quite as steep and rolling as the lands to the south. The only workable land herein lies in sections 30 and 31. This is rolling bench land and though workable the soil is of very doubtful value agriculturally. Commercial value

in timber is not evident, there being a great deal of open patches and old burn with bald rock. To the north some fir and bull pine to 20 inches in diameter are found, but these are scattered through small growth and scrub. Poor grazing exists generally. Lands to the east in range 14 not included in the above examination are composed almost entirely of a steep rocky and precipitous hill running from north to south throughout. There is no value in this part, the timber which is bull pine and fir to 20 inches being very scattered through considerable scrub growth.

Tp. 18, R. 15, W. 6th Mer. *J. E. Ross, D.L.S., 1909.*

The land surveyed in this township lies near the east boundary of range 16. It is reached from Kamloops, 22 miles distant by a fair wagon road. The elevation, 3,300 feet above sea-level, with attendant summer frosts, makes the land useless for fruit growing. However, hay, oats, barley and hardy vegetables do well, while irrigation is not necessary. The surface of the country is generally rolling, and the soil a light sandy loam with numerous protruding rocks. There is no timber of commercial value, a growth of small open poplar and jack pine, not exceeding 6 inches in diameter, covering most of the country; while there is some fir the trees are small and nowhere thick. In sections 12, 1, and the east half of 13, range 16, and sections 18, 7, 6, and the west half of 8, range 15, there are numerous small meadows, of which the largest is forty-three acres in extent. These meadows produce good crops of wild hay, which is now used for wintering stock. While hay always commands a good price throughout the province the expense of hauling from these meadows to Kamloops, the nearest market, would leave a doubtful chance of profit. In the southwest quarter of section 7 and the northwest quarter of section 6, range 15, there is a lake of fair water about 30 acres in extent and locally known as 'Wolf lake.' With the exception of Campbell creek there is no permanent supply of running water in the sections surveyed; however, numerous springs provide water for stock and domestic purposes. The winters are long, extending from the latter part of October till April; the summers are fine with cool nights. Campbell lake in range 15 is a popular resort for sportsmen, who can generally depend on a good bag of wild duck along its shores every spring and fall. There are some bears in the neighbourhood, and grouse are fairly plentiful, while packs of coyotes make the nights hideous with their yelping. Doubtless the presence of these coyotes accounts for the comparative scarcity of deer in what should, from the nature of the country, be one of their favourite resorts. No minerals were seen in these townships.

A. V. Chase, D.L.S., 1910.—SECS. 1 TO 4; SEC. 5, E. $\frac{1}{2}$; SEC. 8, E. $\frac{1}{2}$; SECS. 9 TO 12.—Nearly all over 4,000 feet above sea-level, very high in the south parts, with a great deal of bald rock with jack pine scrub and thickets, in the lower altitudes to the north stretches of small fir appear with some bull pine to 10 inches diameter, no agricultural value, poor grazing.

A. J. Campbell, D.L.S., 1909.—SEC. 5, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—On slope of mountain rising to east from 256 feet upwards, no land of agricultural value, thickly covered with small jack pine and poplar 2 to 5 inches of no timber value, grazing poor.

SEC. 6, NE. $\frac{1}{4}$.—Greater part of low rock hills, worthless, a small area of low land along Campbell creek in NE. corner from 2,600 to 2,900 feet, soil black loam on low land, thick small jack pine, poplar and willow brush some grass in places.

NW. $\frac{1}{4}$.—Rock hills over quarter, part of Wolfe lake on NW. marshy shores in bays, small jack pine, poplar and willow, some grass in places.

SE. $\frac{1}{4}$.—Rocky hills to NW. and SW. with low marshy brush flat between from 2,600 to 2,800 feet, hay land, soil clay loam and black loam, thick small jack pine, poplar and willow brush with a few scattered fir on slopes to south, some grazing.

SEC. 6, SW. $\frac{1}{4}$.—Low rock hills, steep rock slopes to SW. from 2,000 to 2,900 feet, no land of agricultural value, small jack pine, poplar and brush, with a few scattered fir to 10 inches, no timber value, grazing poor.

SEC. 7.—Bench land, slopes falling to west and to east, from 2,480 to 2,800 feet, considerable land could be cultivated but high altitude, part of Wolfe lake on SW. $\frac{1}{4}$, meadow land along east boundary in both quarters at elevation of 2,570 feet above river, soil black loam and clay loam, considerable rock on low hills to south part of section, small jack pine, poplar and willow, scattered fir to 20 inches in places to north of section, some timber value, fair grazing.

SEC. 8, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—A few acres of meadow land along west boundary, slope of mountain rising to east, some bench land to north from 2,515 to 2,900 feet, not suitable for agriculture, hay land on meadow, black loam and clay loam, thick small jack pine, poplar and brush of no timber value, fair grazing.

A. V. Chase, D.L.S., 1910.—SECS. 13 TO 10; SEC. 17, E. $\frac{1}{2}$; SEC. 23, SE. $\frac{1}{4}$; SEC. 24, S. $\frac{1}{2}$, NE. $\frac{1}{4}$.—From 3,500 to 4,000 feet above sea-level, rough rolling country of no agricultural value, bull pine and fir to 8 inches diameter, with small growth of poplar and spruce in gullies, fir to 10 inches diameter is found in the northeast part of this area.

A. J. Campbell, D.L.S., 1909.—SEC. 17, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land rising gently to east, from 2,515 to 2,800 feet, too high for farming, soil clay loam, small jack pine and poplar with a few fir to 15 inches to west, fair grazing land.

SEC. 18, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Bench land, broken by deep ravine of Campbell creek, considerable part of land to west and east could be cultivated, of doubtful farm value, 2,365 to 2,800 feet above river, soil clay loam, small jack pine, fir, poplar and brush, with some fir on hills to 25 inches of some timber value, fair grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land, slopes rising to east from Campbell creek to west, falling on west boundary, from 2,480 to 2,800 feet above river, considerable part could be cultivated, of doubtful farm value, soil clay loam, small jack pine, fir, poplar and brush with fir up to 25 inches on higher ground, of some timber value, fair grazing.

SEC. 19, SE. $\frac{1}{4}$.—Bench land, broken slopes rising to east from 2,400 to 2,750 feet, considerable land to SE. could be cultivated, of very doubtful farm value, soil clay loam, small jack pine, fir and poplar with fir up to 20 inches, of some timber value, fair grazing.

SEC. 20, NE. $\frac{1}{4}$ (S. $\frac{1}{2}$), SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough, broken slopes rising to south, rocky on eastern part from 2,480 to 2,850 feet, of no agricultural value, thickly covered with small jack pine, fir, poplar and some spruce, of no timber value, some grass.

SEC. 21, NE. $\frac{1}{4}$.—Strip of low land and some meadow land along Woodland creek, gentle slopes to north and slopes of mountain to south, all of quarter could be cultivated, 2,370 to 2,540 feet, soil black loam and clay loam, bull pine and fir to north up to 30 inches, small poplar, fir and brush, covered with fir to 8 inches on south, of some timber value, land 25 to 50 per cent farm, some grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—On slope of mountain rising to south from 2,525 to 3,080 feet, rocky in part, of no agricultural value, small fir, poplar and willow brush with fir to 8 inches not of profitable timber value, fair grazing.

SEC. 22, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Bench land, very rolling to east, low land and small meadow to west, considerable part suitable for cultivation, from 2,360 to 2,625 feet, soil black loam and clay loam, small spring creek near east boundary, small jack pine, fir, poplar and willow with some fir to 20 inches to west, of some timber value, land 15 to 50 per cent farm value, some grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—On slope of mountain rising to south from 2,525 to 3,080 feet, of no agricultural value, very thick poplar, fir, jack pine, spruce and willow, brush with some fir to 10 inches to west, grazing poor.

SEC. 23, NE. $\frac{1}{4}$.—Bench land, rough and broken, 2,450 feet upwards, small rocky ridges, broken on east by ravine of creek, with very steep rising to east of creek, only suitable for cultivation in very small patches soil, clay loam, thick small jack pine, fir, poplar and willow brush, some grazing.

NW. $\frac{1}{4}$.—Bench land, rolling, considerable part suitable for cultivation, slopes steep to south, from 2,350 to 2,700 feet above river, soil clay loam rocky in parts,

thick small jack pine, poplar, fir and willow brush, small spring creek on west, land 30 per cent farm, some grazing.

SW. $\frac{1}{4}$.—On slopes of mountains rising to south from 2,625 to 3,100 feet above river, of no agricultural value, very thick jack pine, poplar, fir, spruce and willow, some grazing.

SEC. 24, NW. $\frac{1}{4}$.—Steep broken slopes, rocky in part, from 2,680 to 3,150 feet, of no agricultural value, fir up to 10 inches, scattered to west, small jack pine, fir, poplar generally, of no timber value, some grazing.

SEC. 25, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Bench land, small valley falling to east, slopes to south very steep and rocky, considerable land in NW. $\frac{1}{4}$ and some to west in NE. $\frac{1}{4}$ suitable for cultivation, soil black loam and some gravel, fir from 8 to 20 inches scattered over, small fir, jack pine and poplar, of some timber value, land 15 to 30 per cent farm value, fair grazing.

SEC. 25, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Very steep slopes rising to south, rocky in part from 2,440 to 3,050 feet, of no agricultural value, small fir, jack pine, poplar and willow, scattered fir in parts up to 20 inches to west of section, some grazing.

SEC. 26, NE. $\frac{1}{4}$, LS. 14.—Bench land, rolling, with flat pieces of land small meadows, steep rocky slope in SE. corner, from 2,190 to 2,440 feet above river, considerable land suitable for cultivation, black loam and clay loam thinly covered with fir and bull pine to 30 inches to north of quarter scattered fir to 15 inches small bushy fir, poplar and willow, land 25 to 60 per cent farm, fair grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land, rolling, steep, rocky slopes along east and rock showing in places to south, from 2,210 to 2,685 feet, good part of land on north suitable for cultivation, Robbins creek runs through SE. $\frac{1}{4}$, soil black loam and clay loam with gravel in places, fir up to 20 inches and small bushy fir, poplar, jack pine and willow brush, of some timber value, land 25 to 50 per cent farm land, some grazing.

SEC. 27.—Bench land, rolling, greater part of section suitable for cultivation, Robbins creek across NE. $\frac{1}{4}$ and small spring creek near east boundary, from 2,130 to 2,540 feet, soil clay loam with some gravel and rock in a few places to south, thinly covered with fir up to 20 inches, average 12 inches, thick small jack pine, poplar, fir and willow brush with a few bull pine to northern part, of timber value, land 15 to 40 per cent farm, fair grazing.

SEC. 28.—Bench land, hilly, fairly steep slopes rising from NE. and falling to SW. greater part of section on summit at elevation over 2,500 feet, from 2,130 to 2,590 feet, partially suitable for cultivation, soil clay loam, fir up to 25 inches, average 10 inches, and some bull pine to south, partially open in SW. $\frac{1}{4}$, poplar, fir, jack pine and willow brush, of some timber value, land 20 per cent farm, fair grazing.

SEC. 29, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Bench land, hilly, rising from NE. and falling to SW. good part over 2,500 feet, slopes steep at NE., from 2,290 to 2,595 feet, partially suitable for cultivation, part of small lake in NW. $\frac{1}{4}$, soil clay loam, stony in parts, fir and some bull pine to 30 inches, average 12 inches, small poplar fir and willow brush, of timber value, land 20 per cent farm value, fair grazing.

SEC. 31, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Bench land and steep slopes, valley running through NE. $\frac{1}{4}$, steep slopes rising to north and south, from 2,140 to 2,450 feet, partially suitable for cultivation, small patches of low land, soil black loam and clay loam some gravel and solid rock showing, fir up to 25 inches, average 10 inches along east, open slopes to west, of some timber value, land 15 to 30 per cent farm, good grazing.

SEC. 32, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Bench land, rolling, broken by gullies, slope rising to south and to NW. in northern part, low land between, from 2,000 to 2,290 feet, partially suitable for cultivation, soil clay loam with some gravel, fir up to 25 inches average 12 inches, poplar, fir and willow brush, of some timber value, land from 15 to 30 per cent farm value, fair grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land, rolling, slopes rising to SW. fairly steep in places with solid rock showing, from 2,125 to 2,425 feet, partially suitable for cultivation, soil clay loam and some gravel, fir up to 25 inches, average 15 inches, poplar, fir and willow brush, of timber value, land 15 to 40 per cent farm value, fair grazing.

SEC. 33, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land, slope rising gently to south from 1,920 to 2,290 feet, rough and broken in parts, small gullies, a few low patches, very small, partially suitable for cultivation, soil black loam and clay loam, covered with fir up to 25 inches, average 10 inches, poplar, fir and willow brush, land 15 to 40 per cent farm value, fair grazing, of timber value.

SEC. 34, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land, slope rising gently to south very rolling in parts, from 1,875 to 2,285 feet, partially suitable for cultivation, soil clay loam, some gravel, covered with fir up to 12 inches, average 12 inches, and a few scattered bull pine, open to north of NE. $\frac{1}{4}$, small fir, poplar and willow brush, land 15 to 50 per cent farm value, fair grazing, Robbins creek in east part, of timber value.

SEC. 35, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Rolling bench land with fairly steep slopes rising to south from Robbins creek which runs along north, NE. $\frac{1}{4}$ rough and broken, from 1,850 to 2,150 feet, partially suitable for cultivation, soil clay loam with some gravel, to south of creek, covered with fir up to 20 inches average 10 inches, small bushy fir and poplar, to north of creek, open, clumps of poplar, some timber value, land 15 to 50 per cent farm value, fair grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land, rolling, all suited for cultivation, from 2,150 to 2,250 feet above river, soil clay loam with some gravel, fir and some bull pine to south up to 25 inches, average 12 inches, of some timber value, land 15 to 40 per cent farm value, fair grazing.

SEC. 36, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Slopes rising from NW. steep and rocky, falling to SW., with some land in SW. part suitable for cultivation, from 1,750 to 2,510 feet above river, soil clay loam and gravel, fir and bull pine up to 20 inches, average 10 inches, of some timber value, small fir, poplar, jack pine and willow brush, land 30 per cent farm value, fair grazing.

SEC. 36, NW. $\frac{1}{4}$.—Fairly steep, rocky slopes to north with rolling bench land to south, partially suitable for cultivation, from 1,855 to 2,275 feet above river, soil clay loam and gravel, fir and bull pine to 20 inches, average 10 inches, of some timber value, small fir, poplar, jack pine and willow brush, land 30 per cent farm value, fair grazing.

SW. $\frac{1}{4}$.—Rolling bench, greater part suitable for cultivation from 2,150 to 2,250 feet above river, soil clay loam and gravel, fir and bull pine to 20 inches, average 10 inches, of some timber value, small fir, poplar, jack pine and willow brush, land 30 per cent farm value, fair grazing.

Tp. 19, R. 15, W. 6th Mer. *A. J. Campbell, D.L.S., 1909.*

SEC. 1, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Steep broken slopes, deep ravine of Robbins creek slopes rising to west and south from 1,120 to 2,000 feet, no land of agricultural value, slopes rocky in part, fir and bull pine up to 25 inches, average 8 inches, small poplar and fir, of some timber value, fair grazing.

SW. $\frac{1}{4}$.—Rolling bench land, steep slopes to north and east from 1,750 to 1,950 feet, good part of quarter suitable for cultivation, part of lake, bad water, in NW. corner, soil black loam, fir and bull pine to 25 inches, average 10 inches, small fir and poplar, of some timber value, land 25 to 60 per cent farm value, fair grazing.

SEC. 2, NE. $\frac{1}{4}$.—Rolling bench land, slope rising gently to north from 1,880 to 2,000 feet above river, considerable land suitable for cultivation, rock showing in a few places, part of small lake on SE. corner, soil clay loam, gravelly, good part of quarter open, a few scattered fir and bull pine to 30 inches and small poplar and fir, land 60 per cent value as farm land, good grazing.

SEC. 3, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Rolling bench land from 1,870 to 1,990 feet, considerable part suitable for cultivation, solid rock showing on some knolls, lake across NE. $\frac{1}{4}$ into NW. fair water, soil clay loam and black loam, scattered bull pine and fir and open spaces, not of timber value, land 60 cent farm value, good grazing. G. Potter, squatter, NE. $\frac{1}{4}$.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land, small knolls in places, with solid rock showing from 1,915 to 1,990 feet, considerable land suitable for cultivation, a few low

spots, some containing a little water, bad, soil rich clay loam and black loam, scattered bull pine and fir up to 25 inches, average 12 inches, and small fir and poplar, of some timber value, open spaces, land 60 per cent farm value, good grazing.

SEC. 4.—Rolling bench land, solid rock showing in a few places on knolls, a few low spots, some containing water, from 1,870 to 2,230 feet above river, good part suitable for cultivation, soil rich clay loam, scattered bull pine and fir to NE., covered with fir to south and west to 20 inches, average 8 inches, of some timber value, land 60 per cent farm value, fair grazing.

SEC. 5.—Bench land, slopes rising to SW., summit in SW. $\frac{1}{4}$ falling to south and west, from 1,930 to 2,550 feet, partially suitable for cultivation, south slopes rocky, low spots and level benches, soil clay loam and black loam and gravel, NW. covered with fir up to 15 inches, south and east partially open, bull pine and fir up to 25 inches, of some timber value, land 20 to 50 per cent farm value, fair grazing.

SEC. 6, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Bench land, rolling, rock hill in NW. corner, rising to north, from 2,145 to 2,570 feet, partially suitable for cultivation, soil clay loam and black loam and some gravel, open to south and west, very scattered fir and bull pine to 25 inches, small fir, poplar and willow, not of timber value, land 20 to 35 per cent farm value, good grazing.

SEC. 7, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Fairly steep slopes rising from NE. corner from 1,330 to 2,255 feet, small benches partially suitable for cultivation, soil clay loam and black loam, open to north, scattered bull pine and fir to south up to 25 inches, small bushy fir, poplar and willow brush not of timber value, land 15 to 35 per cent farm value, good grazing.

NW. $\frac{1}{4}$.—Rolling bench land to north, very steep slopes to south rising to rock hill, from 1,700 to 2,600 feet above river, only small area to north suitable for cultivation, soil clay loam, fir and some bull pine, scattered, small bushy fir, poplar, not of timber value, land 25 per cent farm value, fair grazing.

SW. $\frac{1}{4}$.—High rock hill to west falling to south and east from 2,100 to 2,720 feet above river, small area bench land along east and south suitable for cultivation, soil clay loam and gravel, open spaces to south, scattered bull pine and fir, scrubby, small fir, poplar and brush, not of timber value, land 20 per cent farm value, fair grazing.

SEC. 8, NE. $\frac{1}{4}$.—Slopes rising to NE. from Buce creek, steep and rocky to north, small area of land suitable for cultivation near creek, creek valley becomes ravine to west, from 1,450 to 1,935, soil clay loam, gravel in parts, open country, land 20 per cent farm land, good grazing.

SEC. 8, NW. $\frac{1}{4}$.—Broken by ravine of Buce creek through centre steep slopes to each side, small area of bench land to SW. suitable for cultivation, soil clay loam and gravel, open to north of creek and partially open to south, fir to 10 inches to south and small poplar, fir, willow brush, land 30 per cent farm value, good grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land rolling gentle slope rising to SW. from 1,700 to 2,145 feet, considerable part suitable for cultivation, soil clay loam covered with fir 8 inches average, of some timber value, and small bushy fir, poplar and willow, land 40 per cent farm land, fair grazing.

SEC. 9, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Rolling bench land rising to NE. from 1,700 to 2,220 feet, rough and rocky along north, land to south suitable for cultivation, small lake to north, poor water, soil black loam in places, clay loam and gravel, open, land 15 to 50 per cent farm, good grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land, slopes rising to NE. and SW. from Buce creek in SW. $\frac{1}{4}$, from 1,700 to 2,005 feet, considerable part suitable for cultivation, soil black loam and clay loam, with some gravel, scattered fir and bull pine to 20 inches average 8 inches, of some timber value, land 60 per cent farm value, fair grazing.

SEC. 10, NE. $\frac{1}{4}$.—Rolling bench land, very steep rough slope falling to NE. in north part, rocky, from 1,680 to 2,250 feet partially suitable for cultivation to south, soil rich clay loam and some gravel, scattered bull pine and fir to 20 inches, average 8 inches, not of much timber value, small fir and poplar, land 40 per cent farm value, fair grazing.

NW. $\frac{1}{4}$.—Rolling bench land, rocky to NE. with very steep slopes, falling in NE. corner, considerable part suitable for cultivation, soil clay loam, very stony in parts, open, clumps of poplar in places land 25 to 50 per cent farm value, good grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land, slopes rising gently to north from 1,920 to 2,130 feet, considerable part suitable for cultivation, rock showing in places on knolls soil, rich clay loam, some gravel, very scattered bull pine and fir to 25 inches, average 8 inches, of no lumber value, land 50 per cent farm, fair grazing.

SEC. 11, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Steep, rough, rocky slopes falling to north, no land of agricultural value, from 1,100 to 2,120 feet above river, scattered bull pine and fir to south, fairly well covered with fir to north and east to 15 inches, average 10 inches, of some timber value, grazing in places, poor.

SEC. 11, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land on west and south, steep, rough slopes falling in NE. part, from 1,590 to 2,115 feet, partially suitable for cultivation, rock showing in places, soil clay loam and gravel, scattered bull pine and fir and small fir and poplar, up to 15 inches, average 8 inches, of some timber value, land 35 to 50 per cent farm value, fair grazing.

SEC. 12, PART NE. $\frac{1}{4}$.—Slopes rising to east and west from Robbins creek, strip of land along creek suitable for cultivation slopes too steep, from 850 to 1,200 feet, dry, requires irrigation, soil clay loam, fir to 20 inches, average 10 inches, small fir, poplar and willow brush of some timber value, land 60 per cent farm value, fair grazing.

NW. $\frac{1}{4}$ SE. $\frac{1}{4}$ (W. $\frac{1}{2}$), SW. $\frac{1}{4}$.—Steep slopes generally rising to west, broken by gullies, no land of agricultural value, except in very small pieces, from 850 to 2,000 feet, soil clay loam, rocky on higher slopes, fir, principally some bull pine up to 20 inches, average 10 inches, of some timber value, small fir and poplar, fair grazing.

SEC. 13, NE. $\frac{1}{4}$.—Rough, rocky hill with steep slopes from 700 to 1,500 feet above river, small piece of land in SW. corner suitable for cultivation, very dry, of doubtful value, clay soil with sand and some gravel, bull pine and fir, scrubby, no timber value, some grazing.

PART NW. $\frac{1}{4}$.—Rough and hilly bench land, high rock hill on east side, partially suitable for cultivation, from 700 to 1,100 feet, very dry and difficult to irrigate, soil light clay and gravel, bull pine and fir, scrubby, small fir, jack pine and poplar, of no timber value, land 15 per cent fruit, grazing poor.

SE. $\frac{1}{4}$.—Rough and hilly slopes rising to east from 850 to 1,375 feet above river, small area of land in SW. corner suitable for cultivation, soil light clay with some gravel, scrubby bull pine and fir, small fir and poplar, of no timber value, land 30 per cent farm, some grazing.

SEC. 15, NE. $\frac{1}{4}$, (S. $\frac{1}{2}$), NW. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Steep rocky slopes rising to south, no land of agricultural value, from 690 to 2,200 feet, fir up to 15 inches, and small fir and poplar and brush, of no timber value, grazing poor.

SEC. 16.—Rock cliffs in north part, rocky hills on south half, from 685 to 2,400 feet, of no agricultural value, fir up to 15 inches in places and a few bull pine on top, of no timber value, fair grazing in places.

SEC. 17.—Rocky cliffs on north and steep slopes rising to east from Buca creek, from 700 feet to 2,300 feet, of no agricultural value, open to west and south, some bull pine and fir in places, of no timber value, good grazing to west and south.

SEC. 18, NW. $\frac{1}{4}$.—Steep rock slopes to north from 890 to 1,600 feet above river, bench land on top, very rough and broken, no land of agricultural value, bull pine and fir, very scattered, of no timber value, fair grazing.

SE. $\frac{1}{4}$.—Very steep slopes rising from Buca creek in east part of quarter, bench land to west, partially suitable for cultivation, from 900 to 1,650 feet above river, dry, requires irrigation, soil clay loam, open to north and east, some fir and bull pine to southwest, scattered, of no timber value, land 25 per cent farm value, good grazing.

SW. $\frac{1}{4}$.—Rough hilly bench land, from 1,450 to 1,775 feet above river, small pieces of land suitable for cultivation, soil light clay loam, scattered bull pine and fir, of no timber value, land 25 per cent farm, fair grazing.

SEC. 19, NE. $\frac{1}{4}$ (S. $\frac{1}{2}$), NW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—High rock hill, from 680 to 1,500 feet of no agricultural value, scrubby growth of bull pine and fir and small fir and poplar, of no timber value, some grazing.

SW. $\frac{1}{4}$.—Steep rocky slope rising to north, and one to south with some land in valley between, from 890 to 1,500 feet, very dry, requires irrigation, soil light clay, some gravel, open in valley, scrubby fir and bull pine on slopes, land 25 per cent farm, fair grazing.

SEC. 20, NE. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Bench land on ridge of hill, rocky, slopes falling to north and south from 770 to 990 feet above river, no land of agricultural value, scattered fir and bull pine to 20 inches, of no timber value, fair grazing land.

FRAC. SE. $\frac{1}{4}$.—Rough slopes rising from Buce lake from 610 to 950 feet, small area of low land along Buce creek, very dry, requires irrigation, soil light clay loam and very stony, scattered bull pine and fir up to 20 inches, small fir and poplar, of no timber value, open to west, land 25 per cent farm value, fair grazing land.

SEC. 21, NE. $\frac{1}{4}$.—Rolling bench land, considerable part suitable for cultivation, from 640 to 840 feet, very dry, difficult to irrigate, soil light clay loam and sandy clay, scattered bull pine and fir to 12 inches, of no timber value, land 35 per cent fruit value, fair grazing.

SEC. 21, FRAC. NW. $\frac{1}{4}$.—Rolling bench land to north and east, high rocky hill to SW. from 650 to 990 feet, some land to north and east suitable for cultivation, dry and difficult to irrigate, soil light clay loam and sandy clay with rock, very scattered bull pine, fir, of no timber value, land 25 per cent fruit value, fair grazing.

SE. $\frac{1}{4}$.—Bench land, low parts, rocky hill in NE. part, and rocky in SW. part, good land between, from 690 to 1,000 feet, very dry, requires irrigation, soil light clay loam and sandy clay, open, some bull pine and fir on hills, of no timber value, land 40 per cent fruit value, good grass.

FRAC. SW. $\frac{1}{4}$.—Bench land, rough and hilly, slopes rising from shore of Buce lake from 610 to 950 feet, some land in NE. part suitable for cultivation, very dry, difficult to irrigate, soil light clay loam, solid rock showing in places, very scattered bull pine and fir up to 15 inches, of no timber value, land 30 per cent fruit value, grass.

SEC. 22, NE. $\frac{1}{4}$.—Bench land, very rolling, considerable solid rock showing, from 740 to 885 feet, part to west suitable for cultivation, dry, difficult to irrigate soil, light, clay loam, thinly covered with bull pine and fir, average 12 inches, not of much timber value, land 30 per cent fruit value, grass throughout.

NW. $\frac{1}{4}$.—Bench land rolling gently, from 640 to 740 feet, dry, difficult to irrigate, soil light clay loam thinly covered with bull pine and fir, average 12 inches not of much timber value, land 30 per cent fruit value, grass throughout.

SE. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Rolling bench land, from 690 to 830 feet above river, dry, difficult to irrigate, soil light clay loam, thinly covered with bull pine and fir, average 12 inches, not of much timber value, land 20 per cent fruit value, grazing.

SW. $\frac{1}{4}$.—Rock hill on north, steep rocky slopes to south, from 690 to 860 feet, land between suitable for cultivation, dry soil clay loam, open on low land, thinly covered with bull pine and fir on hills, scrubby, of no timber value, land 30 per cent fruit value, grazing.

SEC. 23, N E. $\frac{1}{4}$, SE. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Rolling bench land, gentle slopes falling to north and east from 600 to 850 feet, very dry, soil light clay loam, thinly covered with bull pine and fir, average 12 inches, land 20 per cent fruit value, grass.

SEC. 23, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Rocky hill with gentle slopes falling to north and south from 630 to 900 feet, partially suitable for cultivation, very dry, soil light clay loam, thinly covered with bull pine and fir averaging 12 inches, not of much timber value, land 20 per cent fruit value, fair grazing.

SEC. 24, NE. $\frac{1}{4}$.—Monté creek and Robbins creek with deep ravines, rolling bench land to west part of quarter and in SE. corner, from 260 feet to 625 feet, very dry, soil light clay loam, scattered bull pine and fir, averaging 12 inches, of no timber value, land 20 per cent fruit value, grazing.

SE. $\frac{1}{4}$.—Steep rock slope rising to SE. from Robbins creek from 500 to 1,300 feet, rolling bench land to NW., small bench in NE. corner, requires irrigation, soil light clay loam, very scattered bull pine and fir, averaging 12 inches, of no timber value, land 20 per cent fruit value, grass.

NW. $\frac{1}{4}$, SW. $\frac{1}{4}$, (N. $\frac{1}{2}$).—Rolling bench land, steep slopes falling to river on north, 360 to 775 feet, requires irrigation, soil light clay loam, very scattered fir and bull pine averaging 12 inches, of no timber value, 20 per cent fruit value, grazing.

SEC. 25, PART SE. $\frac{1}{4}$.—Steep slopes rising to east from Monté creek, 150 to 620 feet above river, no land of agricultural value, very scattered fir and bull pine averaging 12 inches, of no timber value, grazing.

PART SW. $\frac{1}{4}$.—Rolling bench land, broken by gullies, steep slopes on south, 200 to 600 feet, partially suitable for cultivation, very dry, soil light clay loam, very scattered fir and bull pine averaging 12 inches, of no timber value, 30 per cent fruit value, grazing poor.

SEC. 26, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough slopes rising to south, 200 to 700 feet, broken by deep gullies, small benches suitable for cultivation, requires irrigation, soil light clay loam, rock in places, partially open with a few scattered scrubby fir and bull pine, of no timber value, 15 to 30 per cent fruit value, grazing poor.

SEC. 27, SE. $\frac{1}{4}$.—Slopes rising to south, very broken by deep gullies 290 to 740 feet, very small benches suitable for cultivation, difficult to irrigate, soil light clay with rock showing to south, open in part, very scattered scrubby fir and bull pine, 20 per cent value as fruit, some grazing.

SEC. 27, PART NW. $\frac{1}{4}$.—Steep broken slopes rising to south, 100 to 650 feet above river, no land of agricultural value, very scattered fir and bull pine, of no timber value, grazing.

SEC. 27, PART SW. $\frac{1}{4}$; SEC. 28, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Bench land, gently rolling, 640 to 770 feet, requires irrigation, all suitable for cultivation, soil light clay loam and sand, thinly covered with bull pine and fir up to 20 inches, not of much timber value, small fir and poplar, 25 per cent fruit value, grazing.

SEC. 28, NW. $\frac{1}{4}$.—Steep rocky slopes to north, falling to river, rolling bench land to south, 150 to 675 feet, partially suitable for cultivation, requires irrigation, soil light clay loam with some sand, scattered bull pine and fir up to 20 inches, not of much timber value, 25 per cent fruit value, grazing.

SEC. 29, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Steep slopes to north, broken by deep gullies running to south, 200 to 675 feet above river, rolling bench land along south, requires irrigation, no apparent means of irrigation, soil light sandy clay loam and small gravel, open on north, very scattered bull pine and fir to 20 inches on south, not of profitable timber value, 25 per cent fruit value, grazing.

SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rolling bench land, slopes rising to south, 660 to 960 feet, rocky hill in SW. $\frac{1}{4}$, partially suitable for cultivation, requires irrigation, difficult to irrigate, soil light sandy clay loam and some gravel, scattered fir and bull pine to 20 inches, of no timber value, 25 per cent fruit value, grazing.

SEC. 30, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$.—Steep rocky slope to north, broken by deep gullies and ravines, from 210 to 740 feet, bench land to south, rolling, partially suitable for cultivation, dry, difficult to irrigate, soil light sandy clay loam and small gravel, partially open, very scattered bull pine and fir to 20 inches, of no timber value, 25 per cent fruit value, grazing.

PART SW. $\frac{1}{4}$.—Rolling bench land, level, 690 feet above river, very dry, difficult to irrigate, soil light sandy clay loam and small gravel, very scattered bull pine and fir to 25 inches, of not much timber value, 25 per cent farm value, grazing.

Tp. 20, R. 15, W. 6th Mer. *R. D. McCaw, D.L.S., 1909.*

SEC. 1, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$ and SW. $\frac{1}{4}$ (N. $\frac{1}{2}$); SEC. 2, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$ and SE. $\frac{1}{4}$ (N. $\frac{1}{2}$); SEC. 3, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$ (N. $\frac{1}{2}$); SEC. 4, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 5, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 6, NE. $\frac{1}{4}$ (N. $\frac{1}{2}$); SEC. 7, (WHOLE SEC.); SEC. 8, (WHOLE SEC.); SEC. 9, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 11, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 12, SE. $\frac{1}{4}$.—Generally dry, rough broken slopes,

with many steep slopes and rocky outcrops, with a general slope falling to South Thompson river, altitude rises to over 2,500 feet, in places and the greater part of land is over 2,000 feet above the river, the land is usually open with scattering fir and bull pine in places, this is usually scrubby but the following lands have timber of possible value: E. $\frac{1}{2}$ of NW. $\frac{1}{4}$ of sec. 7, W. $\frac{1}{2}$ of NE. $\frac{1}{4}$ of sec. 7, E. $\frac{1}{2}$ of sec. 8 and NE., SE. and SW. $\frac{1}{4}$'s of sec. 11, the rest of the timber is of rather doubtful value for merchantable purposes, fair grazing exists throughout.

SEC. 12, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$; SEC. 13, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Gently rolling land broken in places, 1,950 to 2,300 feet, above the South Thompson river, soil light clay, parts very stony, scrubby fir poplar and willow scrub with some spruce and much wind-fall in places. The land is nearly all workable but is of doubtful farm value owing to altitude, irrigation if needed would be difficult to obtain, a few grass marshes are scattered throughout, good grazing land, timber is of small value except for the use of settlers.

SEC. 13, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$.—Rolling slopes broken in places, 1,690 to 2,150 feet above the South Thompson river, soil sandy loam with some stone, scattering fir to 20 inches, diameter in scrub poplar, willow, jack pine and fir, possible timber value, 25 per cent farm land needing irrigation which is very difficult to obtain.

SEC. 14, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough slopes rising from 1,860 to 2,500 feet above the South Thompson river, often very steep, growth of small fir, poplar and willow with a few scattering fir to 18 inches diameter, very poor timber value, fair grazing land.

SEC. 17, NW. $\frac{1}{4}$ (E. $\frac{1}{2}$), NE. $\frac{1}{4}$, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Rough rolling land rising rapidly in east part of section, 1,860 to 2,500 feet above the South Thompson river, soil consists in many places of black loam and generally clay and sandy loam with stone and rock outcrops in places, much land is open with scattering poplar clumps and scrubby fir and bull pine of very doubtful value, good grazing land, much of soil is suitable for farming, but the altitude and difficulty of irrigation makes it very doubtful farm land.

SEC. 18, NW. $\frac{1}{4}$ (N. $\frac{1}{2}$), SW. $\frac{1}{4}$ (S. $\frac{1}{2}$).—Broken slopes, 1,650 and upwards above the South Thompson river, much rock, stony loam soil, a few scattering fir and bull pine, fair grazing land.

SEC. 19, NE. $\frac{1}{4}$ (E. $\frac{1}{2}$), SE. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Rough rolling slopes over 2,000 feet above the South Thompson river, soil light clay and stone with some black loam, south part open with scattered poplar clumps, north part has fir and spruce up to 30 inches diameter and of fair lumber value, fair grazing throughout.

SEC. 20, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$.—Shallow valley runs north through centre of these quarters, with rolling slopes rising on each side 2,000 to 2,300 feet above the South Thompson river, soil light clay and stone with some black loam, SW. $\frac{1}{4}$ has much open land with scattering fir up to 30 inches, north part probable timber value, NW. $\frac{1}{4}$ has fir to 30 inches, and much poplar to 1 foot diameter, also much scrub, fair lumber value, all fair grazing land.

SEC. 20, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$; SEC. 21, NE. $\frac{1}{4}$, NW. $\frac{1}{4}$ (N. $\frac{1}{2}$).—Broken slopes rising to east, 1,850 to 2,500 feet above the South Thompson river, sandy and clay loam, with stone, fir to 30 inches, scattered in thick scrub, fair lumber value, fair grazing value throughout.

SEC. 22, NE. $\frac{1}{4}$ FRAC.; LEGAL SUB. 11.—Small area of flat land below steep hill side and west of lot 549, altitude 1,700 feet above the South Thompson river, soil black clay loam, thick growth of spruce, poplar and fir to 12 inches, 50 per cent farm value, rest of land is broken and hilly having fir to 18 inches of fair value, scant grazing throughout.

SEC. 23, NW. $\frac{1}{4}$ (S. $\frac{1}{2}$).—Open grass marsh in north part with broken slopes rising to the south, 1,670 to 1,850 feet above the South Thompson river, soil sandy loam, stony, small poplar, spruce, jack pine and fir with some fir to 20 inches, of possible value, NE. part 25 to 40 per cent farm land, all fair grazing.

SW. $\frac{1}{4}$ (N. $\frac{1}{2}$), SE. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Generally broken slopes rising to south with small area of workable slope at north, 1,800 to 2,300 feet above the South Thompson river, soil sandy clay and loam generally stony, fir to 20 inches diameter scattered in thick

scrub and windfall, much small jack pine and poplar, small timber value, fair grazing land with north part 25 per cent farm land.

SEC. 24, NE. $\frac{1}{4}$.—Gradual rolling slopes falling from east to west 1,970 to 2,060 feet above the South Thompson river, sandy loam with rich dark loam in places, small poplar, birch, jack pine and fir with some fir to 24 inches diameter of possible merchantable value, 25 per cent farm land, irrigation if required could be obtained from Paul creek.

SE. $\frac{1}{4}$.—Gently sloping land falling to SE., 1,805 to 2,020 feet above the South Thompson river, soil sandy loam with black loam in places, stony in parts, young poplar, fir, jack pine and birch with scattering fir to 36 inches, possible timber value, 25 per cent farm land, irrigation if required may be obtained from Paul creek.

SEC. 24, NW. $\frac{1}{4}$ (S. $\frac{1}{2}$).—Rather rough in parts but much workable land, 1,890 to 1,970 feet above the South Thompson river, sandy loam with black loam in places, stony occasionally, young poplar, fir, spruce and brush with a few fir to 24 inches diameter, 25 per cent farm land, irrigation if needed might be obtained from Paul creek.

SEC. 29, SW. $\frac{1}{4}$, SE. $\frac{1}{4}$ (S. $\frac{1}{2}$).—Broken slopes often rocky falling towards Paul creek, 1,450 to 2,100 feet above the South Thompson river, soil is a sandy loam, young poplar, spruce, jack pine, fir and birch with scattering trees to 30 inches diameter, probable timber value, fair grazing land.

R. D. McCaw, D.L.S., 1910. (FRACTION IN NORTHWEST PART NOT DESCRIBED IN REPORT OF 1909.

The area left in this township is comprised of sec. 19, W. $\frac{3}{4}$, sec. 30, sec. 31 (frac.), and sec. 32, N. $\frac{1}{2}$. The greater part is useless for agriculture, being rocky and broken.

SEC. 19, W. $\frac{3}{4}$.—Rough, broken, rocky slopes with some precipitous slopes, useless for cultivation, timber is scattering and of poor value, fir to 24 inches, with scrub poplar and willows, some fair grazing.

SEC. 30; SEC. 31, S. $\frac{1}{2}$ (FRAC.).—All included in timber berth 442 except northeast $\frac{1}{4}$ of sec. 30, rough, broken, rocky slopes rising to the west, slopes are often precipitous rock cliffs, rising high to the west from 3,200 feet above sea in east part, no possible farm land, much of timber was cut since the examination of 1909, fir to 24 inches, with much scrub and some young poplar to 10 inches diameter; some fair grazing.

SEC. 31, N. $\frac{1}{2}$ (FRAC.).—In timber berth 442, very rough and rocky, rising from 2,845 to 3,660 feet in altitude at the north, no farm value, much good fir and bull pine to 36 inches, scrub in parts, fair grazing.

SEC. 32, N. $\frac{1}{2}$.—Generally rolling slopes becoming steep and broken to the north, some rock outcrops, 2,900 to 3,500 feet above sea-level, rather doubtful agricultural value, northeast $\frac{1}{4}$ of probable value having some rich loam soil, stony, scattering fir and bull pine to 36 inches, poplar and willow scrub, fair grazing.

R. D. McCaw, D.L.S., 1909.—SEC. 32, SE. $\frac{1}{4}$.—Steep slopes rise from SW., 1,700 to over 2,000 feet above the South Thompson river, much rock in parts, fir and jack pine to 20 inches diameter, much scrub and some windfall, fair timber, scant grazing.

SEC. 33 (WHOLE SEC.); SEC. 34 (WHOLE SEC.).—Rolling slopes often steep rising to the north, 2,100 to about 2,800 feet above the South Thompson river, soil light sandy clay, generally stony, some open ground with willow and poplar scrub, and scattering fir and jack pine, the former running to 30 inches diameter and has probable value for lumber in parts, all fair grazing land.

SEC. 35, N. $\frac{1}{2}$; SEC. 36, NW. $\frac{1}{4}$.—Rolling slopes rising over 2,200 feet above the South Thompson river, soil light sandy clay, generally stony, poplar and willow scrub with scattering fir and jack pine, the former running to 24 inches, and has possible value, fair grazing land.

SEC. 36, NE. $\frac{1}{4}$.—Almost level generally, 2,000 to 2,200 feet above the South Thompson river, soil is dark loam, scrub poplar and willow with a few scattering

fir to 24 inches, not likely of timber value, land is all workable but of doubtful farm value owing to altitude, good grazing land.

SW. $\frac{1}{4}$.—Gradual rise to the north, 2,000 to 2,250 feet above the South Thompson river, soil a dark loam, generally stony, much poplar, willow and spruce scrub, and a few fir to 20 inches, fair grazing, slopes are all workable but altitude leaves the quarter of doubtful farm value.

Tp. 21, R. 15, W. 6th Mer. *R. D. McCaw, D.L.S., 1910.*

Almost the entire area seems to have been the site of an old burn. At present the growth is scrubby but from some of the old stumps seen in parts it is conclusive that the township was at one time heavily timbered. Very little land of agricultural value is found therein, and in cases this is doubtful. Some very good land exists at the east end of Hefferly lake, which should prove valuable. Another small area lies along Louis creek in sec. 36. In the south part of secs. 3, 4, 5 and 6 some of the land has possible value, but much is doubtful owing to altitude. The surface of the township is rolling and hilly, the western portion having a slope towards the summit of Lolo mountain. About one-half of the area is below 4,000 feet in altitude.

SEC. 1.—Generally broken and hilly, parts rolling, deep creek ravine traverses the section, some workable land, altitude 3,400 feet to 4,040 feet above sea-level makes it of no agricultural value, scattering fir to 24 inches with much jack pine, poplar and willow scrub, possible value in fir, fair grazing.

SEC. 2; SEC. 3, E. $\frac{1}{2}$.—Composed of slopes to a hill near the centre of sec. 2, 3,700 to over 4,200 feet in altitude, some fir in south $\frac{1}{2}$ to 24 inches diameter, much scrub growth of fir, poplar, willows and jack pine, windfalls in parts, fair grazing.

SEC. 3, SW. $\frac{1}{4}$; SEC. 4, S. $\frac{1}{2}$.—Much workable slope but of very doubtful value on account of altitude, 3,350 to 3,700 feet above sea, light loam with some dark loam in southwest $\frac{1}{4}$ of sec. 3, would need irrigation, parts are too steep and broken for use, some spruce, balsam and fir to 18 inches, usually scrub growth of alders, willows, jack pine, spruce, fir and poplar, windfalls, poor to fair grazing.

SEC. 3, NW. $\frac{1}{4}$; SEC. 4, N. $\frac{1}{2}$; SEC. 5, N. $\frac{1}{2}$.—Slopes rising to the north, some rock, 3,500 to over 4,000 feet above sea-level, parts workable but altitude and exposed position puts agriculture out of the question, a part of the northwest $\frac{1}{4}$ of sec. 5 near the south boundary could be worked, a few scattered fir to 18 inches and some spruce, generally a scrub growth of willow, alder, poplar and jack pine, windfalls common, grazing is poor to good.

SEC. 5, S. $\frac{1}{2}$; SEC. 6, SE. $\frac{1}{4}$.—Much workable slope, parts hilly, 3,350 to 3,660 feet above sea-level, light loam soil, doubtful value owing to altitude, but with irrigation could likely be used for farm land, some fir to 18 inches, but growth is mainly scrubby fir, jack pine, poplar and willows running into fair fir and bull pine in south east $\frac{1}{4}$ of sec. 6, good grazing.

SEC. 6, SW. $\frac{1}{4}$.—Largely workable slopes, 2,845 to 3,300 feet above sea-level, parts rocky and stony, brownish, sandy loam soil, needing irrigation, stream flowing through would furnish some water, fir and bull pine to 30 inches of lumber value, fair grazing, $\frac{1}{4}$ is of likely farm value.

SEC. 6, N. $\frac{1}{2}$.—Generally broken and hilly, small area in southwest corner workable, brownish sandy loam, 3,235 to 3,900 feet above sealevel, much fir and bull pine to 30 inches running into jack pine, willows and scrub growth towards the northeast, fair grazing.

SEC. 7.—Broken, hilly and rocky, parts steep, 3,650 to much over 4,000 feet above sea-level, no agricultural land, some thinly scattering fir to 20 inches, jack pine to 15 inches, with scrub of all kinds, fair grazing.

SECS. 8, 9, 10, 11, 14, 15, 16 AND 17.—Rolling and hilly, and greater part on a general rise to the summit falling to the north, all high land reaching much over 4,000 feet in parts, thick growth of scrub willows, alder, poplar, spruce and patches of small jack pine, fallen and standing dead timber in parts, fair grazing usually on south slopes.

SECS. 12 AND 13.—Rolling, parts hilly and broken, 3,755 to over 4,000 feet in altitude, some marshes and small lakes, useless agriculturally, no merchantable timber value, thick growth of small jack pine, some fir (usually not over 12 inches), spruce and balsam with much scrub of all kinds, southeast $\frac{1}{4}$ of sec. 12 has a few fir to 24 and 30 inches, poor to fair grazing.

SEC. 18 AND 19.—Slope to Lolo mountain at the west, all high land of no agricultural value, generally covered with jack pine, some spruce and small cedar in places, also balsam, usually not over 12 inches diameter, windfalls thick in parts, east part runs into scrub growth.

SECS. 20, 21 AND 22.—All over 4,000 feet above sea-level except the valley of a creek through part of secs. 21 and 22 which is 3,800 feet and upwards, no agricultural land, mostly on northerly slopes falling towards northeast, dense growth of scrub with some patches of small jack pine, much windfall, no grazing value.

SECS. 23, 24, 25, 26 AND 27.—All over 4,000 feet except small portion of southwest $\frac{1}{4}$ of sec. 27, and rising towards a high bare knoll on east boundary of sec. 26, small valley extends through southwest part of sec. 23 towards the southeast, and contains a couple of lakes with marshes, surface of area is rolling and hilly and usually rocky with some steep slopes and covered with a dense growth of alder, willows, jack pine and other scrub, some areas have small jack pine thickly grown, windfalls common, little or no grazing value.

SECS. 28, 29 AND 30.—Badly broken slopes falling to the north, much rock, and often steep, some deep ravines, 3,470 to over 4,000 feet in altitude, useless for cultivation, thickly grown with scrub, willow, alder, jack pine, spruce, some fir and cedar, windfalls throughout, a few fir and cedar to 24 inches but in scant quantity, a few spruce and balsam in parts, no merchantable timber value, no grazing value.

SECS. 31 AND 32 (FRAC. SOUTH OF HEFFERLY LAKE).—Steep broken slopes to Hefferly lake, much rock, no farm value, 3,100 to over 4,000 feet (in southwest corner of sec. 31). Dense scrub growth of all varieties with scattering fir to 24 inches and a few cedar, no grazing value, southeast $\frac{1}{4}$ of sec. 32 has a small area in north part which has possible farm value, but is very stony.

SECS. 31 AND 32 (FRAC. NORTH OF HEFFERLY LAKE).—Rolling and broken, starting to rise steep and rocky in north part of sec. 32, parts workable, brown sandy loam, 3,100 to 3,431 feet above sea-level character of surface and altitude makes value doubtful, much fir to 24 inches and a good deal of jack pine with scrub and windfalls, some recent burn in parts, timber is of value, grazing fair.

SEC. 32 (FRAC. EAST OF HEFFERLY LAKE); SEC. 33, NW. $\frac{1}{4}$.—Much good workable land, parts level, sandy loam, some meadow, 3,100 to about 3,300 feet above sea-level, farm land value, irrigation likely needed for success, a few fir to 18 inches, jack pine to 9 inches, and scrub, some windfall, good grazing.

SEC. 33, S. $\frac{1}{2}$; SEC. 34, S. $\frac{1}{2}$.—Steep, broken, rocky slopes covered with dense scrub growth of all varieties, useless for cultivation or grazing, 3,200 to over 4,000 feet above sea-level.

SEC. 33, NE. $\frac{1}{4}$; SEC. 34, N. $\frac{1}{2}$.—Some good land in north half consisting of sandy loam with much black loam soil near bottom, parts level or gently rolling, south half becomes steep and broken, rising to over 3,700 feet to the south, cedar frequent in the north part to 24 and 30 inches, much has been cut, spruce to 14 inches, much scrub growth and in slopes in south part is very dense, a few fir to 18 inches, timber has probable value, grazing poor to fair, irrigation may be needed in parts.

SEC. 35.—Steep broken slope rising to the south, often rocky, 2,960 to over 4,000 feet in altitude, no agricultural land, covered with dense scrub growth of alders, jack pine, willow, etc., with some windfalls, practically no grazing value.

SEC. 36, SW. $\frac{1}{4}$.—Steep slope rising to southwest covered with scrub and a few clumps of spruce and fir to 15 inches on lower slopes, small jack pine, no grazing value.

SEC. 36, NW. $\frac{1}{4}$.—Small area of workable land near Louis creek in L.S. 14, rest is steep broken slope to the southwest, 2,630 to nearly 4,000 feet in altitude, some fir

to 30 inches, a few spruce to 20 inches on lower slopes, rest is scrub growth consisting of alder, willow, poplar and jack pine, some windfalls.

SEC. 36, E. $\frac{1}{2}$.—Strip of workable land along Louis creek, steep broken slopes on each side, along creek is some black loam soil with sandy loam in slopes adjacent, fair farm value and easily irrigated if necessary, much good fir to 30 inches, some spruce to 24 inches, steep slopes to the west have mainly a scrub growth, timber value in whole area, poor to fair grazing.

Tp. 22, R. 15, W. 6th Mer. *R. D. McCaw, D.L.S., 1909.*

SEC. 1, SE. $\frac{1}{4}$.—Gradual slope in SW. corner rising in steep, rocky slope to the east, gradual slope about 1,600 feet above the North Thompson valley, soil stony, sandy loam, scrub poplar and fir up to 24 inches, possible timber value, 50 per cent farm land.

SW. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Muskeg in NE. corner, balance steep rocky slopes with scrub and fallen timber, muskeg 1,430 feet above North Thompson river, soil stony loam, spruce up to 18 inches diameter, if drained and cleared 50 per cent farm land.

R. D. McCaw, D.L.S., 1910.—All of the land of agricultural value in this township was examined in 1909. Louis creek flows from the southeast corner in a northerly and westerly direction to sec. 34. This creek divides the township into two mountainous slopes which soon rise to over 4,000 feet above sea-level. Christian creek from the west joins Louis creek in sec. 11. The lands unexamined in 1909 are generally covered with timber, although some open areas occur in the east part of the township.

SEC. 1, NW. $\frac{1}{4}$; SEC. 12, N. $\frac{1}{2}$, SE. $\frac{1}{4}$; SEC. 13; SEC. 14, LS. 9, 16; SEC. 23, S. $\frac{1}{2}$, NE. $\frac{1}{4}$; SECS. 24, 25; SEC. 26, E. $\frac{1}{2}$, NW. $\frac{1}{4}$; SECS. 35 AND 36 (ALL EAST OF LOUIS CREEK).—This area is composed of mountainous slopes often steep and precipitous, rising to high altitude in secs. 24, 25 and 36, no possible farm value, McGillvray creek joins Louis creek flowing through a deep ravine in secs. 12 and 13, Tod mountain has its summit a little to the east of secs. 25 and 36, the northeast $\frac{1}{4}$ of sec. 1 has a great deal of fir to 24 inches diameter and is of lumber value, secs. 12 (frac.) and 13 are covered mainly with scrub growth of willows, alder and jack pine with windfalls, some open slopes occur in sec. 13, a few scattering fir exist, but in no part is of timber value, through secs. 24, 25, 36, and east $\frac{1}{2}$ of 35, the main growth is small jack pine with some spruce and balsam, on the lower slopes in secs. 23, 26, and west $\frac{1}{2}$ of 35, there are scattering fir of doubtful value, with small jack pine and scrub in parts, windfalls, poor to fair grazing on lower slopes.

R. D. McCaw, D.L.S., 1909.—SEC. 2, NW. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Rough slope rising towards west, 1,465 feet and upwards, soil stony brown loam, scattering large fir to 20 inches diameter, scrub fir, spruce and jack pine, fair grazing.

SEC. 2, SW. $\frac{1}{4}$ (S. $\frac{1}{2}$).—Gradual slopes in NW. corner from 1,600 to 1,810 feet above the North Thompson, rising in steep rocky slope at NE., soil brown loam with much stone in places, fir up to 48 inches in thick scrub and windfall, fair value, gradual slope, 50 per cent farm value.

R. D. McCaw, D.L.S., 1910.—SEC. 2, SE. $\frac{1}{4}$.—Broken slopes rising south, rocky, covered with scrub growth and windfalls, some jack pine to 8 inches, no grazing value.

R. D. McCaw, D.L.S., 1909.—SEC. 3, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$; SEC. 4, NW. $\frac{1}{4}$, NE. $\frac{1}{4}$, SW. $\frac{1}{4}$; SECS. 5 AND 6.—Rolling slopes, steep in many places and very steep at north, nearly all over 2,000 feet above the North Thompson river, soil sandy loam, stone and rock in many places, fir up to 25 inches and jackpine in most parts, of probable timber value, SW. $\frac{1}{4}$, sec. 4, S. $\frac{1}{2}$ sec. 5, SE. $\frac{1}{4}$ sec. 6, of possible farm value, but likely too high, fair grazing value throughout.

R. D. McCaw, D.L.S., 1910.—SECS. 7, 8, 9, 10, 11 (W. $\frac{1}{2}$), 15, 16, 17, 18, 19, 20, 21, 22 (W. $\frac{1}{2}$), 27 (L. S. 4, 5), 28, 29, 30, 31, 32, 33.—On the east, steep slopes rise

from the lands examined previously and soon attain over 4,000 feet above sea-level, there is no possible farm land value, the upper portion is of hilly nature and rises high in parts, entire area is timbered, the growth being chiefly jack pine with much scrub in parts, some balsam and spruce, also a few fir in places, windfalls common, some old brulé, scrub grown in parts, some fir to 24 inches diameter is found in secs. 11 west $\frac{1}{2}$, 10 east $\frac{1}{2}$, and 15, also some brulé, the rest of the slope on the east is timbered chiefly with jack pine, willows, birch and a few patches of fir, much brulé and a great deal of windfall, grass grows in poor to fair quantity, the higher lands could hardly be called of grazing value, grazing on east slopes is poor.

R. D. McCaw, D.L.S., 1909.—SEC. 12, SW. $\frac{1}{4}$.—Small area of bottom land in SW. corner, altitude about 1,425 feet above North Thompson river, soil rich black loam, open, 100 per cent farm land, steep slopes of scant grazing rise to the east, scrub and windfalls.

SEC. 14, SW. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Small area of workable slope in NE. corner about 1,600 feet above North Thompson river, brown sandy loam with sandy clay subsoil, stony, scrub, 25 per cent farm land, balance steep slopes, scrub and scattering fir up to 18 inches, scant grazing.

NE. $\frac{1}{4}$.—Rather steep mountain side, broken in places, from 1,720 to 2,200 feet above the North Thompson river, stony, sandy loam, scrub, poplar, fir and willow with very scattering large fir, fair grazing.

SEC. 22, SE. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Sloping towards Louis creek, steep slope from west with gradual slope in NE. corner, rises to 1,800 feet above the North Thompson river, stony loam, scrub and a few scattering firs, 20 per cent farm land, scant grazing on steep slopes.

SEC. 23, SE. $\frac{1}{4}$, SW. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Rather steep broken slopes from 1,410 to 2,200 feet above the North Thompson river, soil brownish loam, stony and rocky in places, scrub poplar, fir and willow with a few scattering large fir, fair grazing.

SEC. 23, NW. $\frac{1}{4}$; SEC. 26, SW. $\frac{1}{4}$; SEC. 27, SE. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Rather steep, stony slope rising in very steep slope in NE., 1,300 to 2,200 feet above the North Thompson valley, dark, stony loam, scrub poplar, willow, birch and scattering fir to 24 inches, good grazing.

SEC. 27, NE. $\frac{1}{4}$.—Rather steep broken slopes, 1,265 to 1,870 feet above the North Thompson river, soil sandy loam, very rocky and stony usually, willow, poplar, birch scrub with scattering fir to 24 inches, possible timber value, fair grazing.

SEC. 34, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$.—Rough, broken slopes, rocky and stony, rising steeply to the east, jack pine and scattering fir, of no lumber value, fair grazing.

Tp. 23, R. 15, W. 6th Mer. *R. D. McCaw, D.L.S., 1909.*

SEC. 2, NW. $\frac{1}{4}$, SW. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Broken slopes rising steep to the east, useless for cultivation, scattered fir to 24 inches in poplar and willow scrub with windfalls, fair growth of grass for grazing.

SEC. 3, NW. $\frac{1}{4}$.—Small area of shelving slope near Louis creek in NE. corner about 1,120 to 1,200 feet above the North Thompson valley, soil brown loam 6 inches, clay subsoil stony, small fir and poplar, some large trees 50 per cent farm value.

SEC. 9, NE. $\frac{1}{4}$.—Small area of bottom land along Louis creek, altitude 1,115 feet above North Thompson river, soil, sandy gravelly loam, part under cultivation by John Cahilty, 60 per cent farm land, steep slopes rise to the west.

SEC. 10, NW. $\frac{1}{4}$ (E. $\frac{1}{2}$).—Even bench land with small area of bottom land along creek cultivated by John Cahilty, altitude 1,120 to 1,300 feet above North Thompson river, soil black sandy loam in bottom lands and brown loam 6 inches, stony subsoil on bench, small jack pine and fir up to 24 inches, scattered windfall, 50 to 75 per cent farm value, except north part which is worthless.

SEC. 10, SW. $\frac{1}{4}$, LEGAL SUB. 6.—Bottom land along Louis creek, 1,120 feet above the North Thompson river, soil black sandy loam 6 inches clay loam subsoil gravelly in places large part cultivated by John Cahilty, 75 per cent farm land.

SEC. 10, SE. $\frac{1}{4}$.—Sloping land rising to east, much broken in parts with small area bottom land in SW. corner along Louis creek, 1,120 to 1,545 feet above the North Thompson river, soil black loam in bottom, brown loam and stony on slopes, small jack pine and fir up to 18 inches, brulé and windfalls in places, parts from 20 to 75 per cent farm land.

NE. $\frac{1}{4}$.—Gradual slope in SW. part from 1,220 to 1,350 feet above the North Thompson river, soil dark sandy loam, rather stony, jack pine and fir up to 15 inches in much windfall and some brulé, 30 per cent farm land, steep slopes in NW. part.

SEC. 15, SW. $\frac{1}{4}$ (FRAC.).—Gradual slope rising to the east from 1,115 to 1,300 feet above the North Thompson river, soil sandy gravelly loam, much stone adjoining creek in south part poplar scrub and small jack pine, parts from 25 to 50 per cent farm value, Walter Davidson's buildings are located on legal subdivision 4.

NW. $\frac{1}{4}$ (FRAC.).—Gradual slopes 1,200 to 1,300 feet above North Thompson in SW. part rising in steep slopes to east, soil dark loam, very stony in places, poplar scrub and small jack pine, 25 to 35 per cent farm land.

SEC. 16, NE. $\frac{1}{4}$ (FRAC.), NW. $\frac{1}{4}$ (FRAC.).—Small area of level bottom land below steep mountain side, 1,105 feet above the North Thompson river, soil dark loam, gravelly in places, thick willow and other scrub, swampy in parts, 100 per cent farm land.

SEC. 28, NE. $\frac{1}{4}$.—Gradual slopes in SW. part, broken in places and rising in steep slopes in east, altitude of gradual slopes 1,075 to 1,150 feet above the North Thompson river, soil brown loam 6 inches, with grey loam subsoil, very stony in parts, fir up to 24 inches, young poplar and windfalls, of possible timber value, 25 per cent farm land.

SEC. 33, NE. $\frac{1}{4}$, SE. $\frac{1}{4}$ (W. $\frac{1}{2}$).—Steep, rocky slopes rising to east with small flat in NW. corner of NE. $\frac{1}{4}$, altitude of flat about 950 feet above the North Thompson, soil black sandy loam, timber on slopes, fir up to 24 inches, and some to 5 feet diameter, of good quality, poplar and spruce scrub, flat 50 per cent farm value.

APPENDIX.

WEATHER REPORTS.

TABLE of maximum and minimum temperatures, vicinity of Revelstoke, B.C., during July, August, September, October and November, 1908. Accompanying report of H. G. Wheeler, D.L.S., 1908.

	July.		August.		September.		October.		November.	
	Max. Fahr.	Min. Fahr.	Max. Fahr.	Min. Fahr.	Max. Fahr.	Min. Fahr.	Max. Fahr.	Min. Fahr.	Max. Fahr.	Min. Fahr.
1			82.3	53	75	56	57	50	46	40
2			72	46	65	52	68	42	46	42
3			76	52		50	72	38	45	44
4			84	51	74	50.2	58	31	51	30
5			90	54	72	40	66	42	48	33
6			92	50	70	39.5	64	42	44	43
7			94	53	66	51	68	46	48	44
8			91	51	58	45.5	69	47	51	41
9			83	54	45.5	41.5	68	46	54	32
10			86	50	61	42	67	42	42	26
11			78	46			61	42	40	29
12			84	43	74	47.5	50	35	34	22
13			90	44.5	62	45	62	40	42	31
14			70	43	68	51	62	41	40	24
15					58	51	61	38	31	20
16			82		67.5	48	61	31	34	28
17			84	48	73	38	52	30	38	23
18			86	50	74	44	52	30		32
19				52	65	46	51	31		
20			78	54	75	50	44	38		
21	90	54.2	76	52	69	43	52	37		
22	92	56	74	51	66	40	52	30		
23	82.7	59.8	62	53		31	53	30		
24	80	60	62	53	55	35	51	30		
25	68	56	58	49.5	55	30	52	30		
26	76.3	43	56.5	46.5	54	29	45	38		
27	67	47		43.5	50	45	45	38		
28	66.7	52	66	52	52	41	43	32		
29	74.3	46	68	46	64	45	42	30		
30	72	48.7	70.3	47	65	36	39	30		
31	72	55	73.5	48			42	34		

TABLE OF TEMPERATURES taken in connection with classification of land within the railway belt of British Columbia. Accompanying report of A. O. Wheeler, D.L.S., 1909.

	SEPTEMBER.			OCTOBER.		
	Max.	Min.	Water.	Max.	Min.	Water.
1				55 50	46	Adams Lake 60 a.m. 60 p.m....
2				64	44	" " 58 a.m. 59 p.m....
3					40	" " " " " " " " " " " "
4				62	44	" " 57 a.m. " " " " " "
5				62	49	" " " " " " " " " " " "
6				56	48.5	" " 57.5 a.m. 56.5 p.m.
7				53.5	37	" " 54.5 a.m. " " " " " "
8				42	34	" " 54.5 a.m. " " " " " "
9				53	40	" " 55 a.m. " " " " " "
10				58	46	" " 56 a.m. " " " " " "
11				55	39	" " 55 a.m. 56.5 p.m..
12				56	40.5	" " 54.5 p.m. " " " " " "
13				62.5	43	" " 54 a.m. " " " " " "
14				54	34.5	" " 53.5 a.m. " " " " " "
15					31.5	" " 54 a.m. " " " " " "
16				54	43	" " " " " " " " " " " "
17					36	" " 53 a.m. " " " " " "
18				51	39	" " 53.5 p.m. " " " " " "
19				57.5	40.5	" " 52 a.m. " " " " " "
20				55	47.5	" " " " " " " " " " " "
21				52	39	" " " " " " " " " " " "
22				53	41	" " 51 a.m. " " " " " "
23					48.5	Little Shuswap Lake 51 p.m....
24					36	Big Shuswap Lake 52.5 a.m....
25	54		Adams Lake 61 p.m.		42	" " " 53 a.m....
26	69	41	" " 58 a.m.		40	" " " " " " " " " " " "
27	69	39	" " 58 a.m., 62 p.m.	52	42	Salmon Arm 52.5 a.m.
28	57	48	" " 60 a.m.	45	42.5	" " 52.5 p.m.
29	59	57	" " 62 p.m.		43	" " 52 a.m.
30	50	46	" " 60 p.m.			
31						

TABLE of maximum and minimum temperatures in the vicinity of Eagle Pass Valley during May, June and July, 1909. Accompanying report of A. J. Campbell, D.L.S., 1909.

	MAY.		JUNE.		JULY.	
	Max.	Min.	Max.	Min.	Max.	Min.
1			84	51	94	39
2			68	52	83	34
3			76	40	87	36
4			74	40	87	39
5			62	40	85	41
6			82	37	75	56
7			92	41	70	43
8			92	40	78	44
9			91	41	73	50
10			96	46	72	55
11			99	50	72	43
12					68	50
13			87	48	70	51
14			91	41	76	44
15			79	52	83	48
16			78	52	74	53
17			72	58	84	47
18			78	52	76	46
19			80	43	69	49
20			91	50		50
21			86	44		
22			73	41		
23				43		
24			77	41		
25			81	42		
26	60	52	65	41		
27	84	43	74	43		
28	82	42	83	45		
29	66	46	85	48		
30	57	41	93	50		
31	84	41				

TABLE of maximum and minimum temperatures in the vicinity of the South Thompson River—south of river, during July, August, September, October, November, 1909.

	JULY.		AUGUST.		SEPTEMBER.		OCTOBER.		NOVEMBER.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
1			78	50	91	48	49	41	42	31
2			65	43	91	50	51	31	46	34
3			63	43	87	52	53	29		34
4			62	43	89	54	57	35	42	28
5			67	42	85	57		38	41	30
6				40	91	48	53	39	44	26
7			72	34	84	46	55	30	39	28
8			70	36	74	52	48	29	44	29
9			72	47	75	48	54	36	43	33
10			69	41	70	47	53	39	58	30
11			72	38	66	46	54	33	42	22
12			76	40	74	44	54	36	30	24
13			77	43	64	46	48	40	45	16
14			78	44	72	36	50	28	22	8
15			68	43	71	36	48	26	27	8
16			68	39		41		32	28	18
17			76	38	76	43	49	34	29	22
18			79	38	64	36	47	30	43	31
19			82	38	58	43	51	34	42	32
20				39	52	43	52	36	44	25
21	90	48	77	44	53	36	48	32	32	14
22	85	54	68	52	53	41	51	33		21
23	88	53	74	43	72	34		37	42	27
24	82	54	66	53		38	57	32	33	20
25	73	52	67	47	69	44	53	31	37	34
26		49	65	52	70	30	50	34		
27	75	55	69	56	59	28	49	25		
28	76	57	73	40	59	39	48	36		
29	81	50	83	51	55	47	38	33		
30		54	85	51	50	39	44	30		
31	75	45	84	46			46	34		

TABLE OF TEMPERATURES taken in connection with the classification of land within the railway belt of British Columbia, 1909. Accompanying report of R. D. McCaw, D.L.S., 1909.

	JUNE.			JULY.		
	Max.	Min.	Water.	Max.	Min.	Water.
1				76	52	Little Shuswap Lake 56 a.m.... 61 p.m....
2					45	" " 56 a.m....
3				92	53	South Thompson River 56 p.m..
4				90	55	" " 54 a.m..
5						" " 58 p.m..
6				91	50	" " 55·5a.m.
7						" " 58 p.m..
8				71	52	" " 54 a.m..
9						" " 57 p.m..
10	81		Shuswap Lake 65 p.m....	60	50	" " 50·5a.m.
11	85	40	" 60 a.m.....			" " 56 p.m..
12	79	42·5	" 65 p.m.....	70	55	" " 57 a.m..
13	72	53·5	" 62 p.m.....	70	54	" " 60 p.m..
14			" 54 a.m.....	74·5	52	" " 57 a.m..
15	68	46	Little Shuswap Lake 57 p.m....			" " 60 p.m..
16	81	46·5	" "	74	50·5	" " 58 p.m..
17	70	59	" "			" " 60 a.m..
18	69	56	" "			" " 59·5p.m.
19	61	51	" "	78	50	" " 58·5a.m.
20	72	49	" " 57 a.m....			" " 60 p.m..
21	74	51	" " 57 a.m....	78	50	" " 58 a.m..
22	78	51	" " 54 p.m....			" " 60 p.m..
23	67	50	" " 57 a.m....	71	50	" " 61 p.m..
24	64	48	" " 58 p.m....			" " 59 a.m..
25	64	50	" " 50 a.m....	71	51	" " 60 p.m..
26	62	50	" " 52 p.m....			" " 58 a.m..
27	67	52	" " 50 a.m....	70	50	" " 60 p.m..
28	63	50	" " 51 p.m....			" " 58 a.m..
29	63	50	" " 50 a.m....	77	52	" " 60 p.m..
30	80	48·5	" " 53 p.m....			" " 55·5a.m.
31			" " 49 a.m....	79	48·5	" " 62 p.m..
			" " 52 p.m....			" " 56 a.m..
			" " 54 p.m....	88·5	51	" " 63 p.m..
			" " 55 a.m....			" " 60 a.m..
			" " 56 a.m....	84	55	" " 62 p.m..
			" " 57 a.m....			" " 58 a.m..
			" " 58 a.m....	84	50	" " 64 p.m..
			" " 59 a.m....			" " 61 p.m..
			" " 60 a.m....	81	.....	" " 62 a.m..
			" " 61 a.m....	68·5	58·5	" " 61 p.m..
			" " 62 a.m....			" " 59 a.m..
			" " 63 a.m....	71	50·5	" " 62 p.m..
			" " 64 a.m....			" " 61 a.m..
			" " 65 a.m....			" " 60 p.m..
			" " 66 a.m....			" " 59 a.m..
			" " 67 a.m....			" " 58 a.m..
			" " 68 a.m....			" " 60 p.m..
			" " 69 a.m....			" " 59 a.m..
			" " 70 a.m....			" " 58 a.m..
			" " 71 a.m....			" " 60 p.m..
			" " 72 a.m....			" " 59 a.m..
			" " 73 a.m....			" " 58 a.m..
			" " 74 a.m....			" " 60 p.m..
			" " 75 a.m....			" " 59 a.m..
			" " 76 a.m....			" " 58 a.m..
			" " 77 a.m....			" " 60 p.m..
			" " 78 a.m....			" " 59 a.m..
			" " 79 a.m....			" " 58 a.m..
			" " 80 a.m....			" " 60 p.m..
			" " 81 a.m....			" " 59 a.m..
			" " 82 a.m....			" " 58 a.m..
			" " 83 a.m....			" " 60 p.m..
			" " 84 a.m....			" " 59 a.m..
			" " 85 a.m....			" " 58 a.m..
			" " 86 a.m....			" " 60 p.m..
			" " 87 a.m....			" " 59 a.m..
			" " 88 a.m....			" " 58 a.m..
			" " 89 a.m....			" " 60 p.m..
			" " 90 a.m....			" " 59 a.m..
			" " 91 a.m....			" " 58 a.m..
			" " 92 a.m....			" " 60 p.m..
			" " 93 a.m....			" " 59 a.m..
			" " 94 a.m....			" " 58 a.m..
			" " 95 a.m....			" " 60 p.m..
			" " 96 a.m....			" " 59 a.m..
			" " 97 a.m....			" " 58 a.m..
			" " 98 a.m....			" " 60 p.m..
			" " 99 a.m....			" " 59 a.m..
			" " 100 a.m....			" " 58 a.m..

TABLE OF TEMPERATURE taken in connection with the classification of land within the railway belt of British Columbia, 1909. Accompanying report of R. D. McCaw, D.L.S., 1909—*Continued.*

	AUGUST.			SEPTEMBER.		
	Max.	Min.	Water.	Max.	Min.	Water.
1						
2						
3				85	50	
4				75	43	
5				80	40	
6				78	40	
7				79	40	
8				72	40	
9					40	
10				64·5	52	North Thompson River 57 a.m.
11				70	47	" " 56 p.m.
12				69	41·5	" " 53 a.m.
13	85·5		South Thompson River.....	66·5	44	" " 55 a.m.
14	87		" "			" " 55 p.m.
15	75	57	" " 60·5p.m.	67	36·5	" " 52·5a.m.
16	78	53	" " 57 a.m..			" " 52·5p.m.
17	77	50	" " 56 a.m..	76	41	" " 50·5a.m.
18	88·5	47·5	" " 61 p.m.	82	38	" " 53 p.m.
19	90	53	" " 58·5a.m.	63	42·5	" " 50 a.m.
20		56·5	" " 59 p.m..	61	34	" " 53 p.m.
21	70·5		Kamloops Lake 64 a.m.	62	43	" " 50·5a.m.
22	67	55	" " 59·5p.m.	56	43·5	" " 50 a.m.
23	73	44·5	" " 60 a.m.....			" " 50·5p.m.
24	72	53·5	" " 61 p.m.....	57	38	" " 49 a.m.
25	71	51	" " 66·5 a.m.....	56	43·5	" " 50 p.m.
26	70	53	" " 60 5 p.m.....	67	34·5	" " 49·5a.m.
27			" " 59 a.m.....			" " 50·5p.m.
28	80	47	" " 58·5 a.m.....	72	41	" " 50 a.m.
29	82	49	" " 57 a.m... ..			" " 50·5p.m.
30	83	53	" " 59·5 p.m.	51·5	41	" " 52 p.m.
31			" "	55	37	" " 51 a.m.
			" "	62	34·5	" " 52·5p.m.
			" "			" " 50 a.m.
			" " 53 a.m.....		41·5	" " 52 p.m.
			" " 60 p.m.....			" " 50 a.m.
			" " 61·5 a.m.....	55	51	" "
			" " 62·5 p.m.....			" "
			" " 59 a.m.....	48·5	44	" "
			" " 60·5 p.m.....			" "

TABLE OF TEMPERATURE taken in connection with the classification of land within the railway belt of British Columbia, 1909. Accompanying report of R. D. McCaw, D.L.S., 1909—*Continued.*

	OCTOBER.			NOVEMBER.		
	Max.	Min.	—	Max.	Min.	—
1	58·5	40		43·5	27	
2	64	39		47·5	29	
3	64	35·5		53·5	28·5	
4	62	34·5		38	26·5	
5	59	50		40	25	
6	48·5	41·5		40·5	24·5	
7	45	31		35·5	23	
8	37·5	28		42·5	27·5	
9	58·5	37·5		37·5	27	
10	56·5	37·5		39·5	30	
11	52·5	27·5			28	
12	58	28·5		.....	
13	57	40		31		
14	51·5	22		24·5	16	
15	46·5	22		22·5	5·5	
16	44	24		22	7·5	
17	43	22		29	20	
18	45	27		34	25	
19	52·5	29		37	25	
20	.....	28·5		33·5	24·5	
21	.....			24·5	20	
22	.....			25	9	
23	45	30		38	9·5	
24	46	26		45·5	9·5	
25	.....	26		40	9	
26	45·5	30·5		36	9·5	
27	.....	26		34·5	13·5	
28	.....				
29	44·5	35				
30	43	27				
31	46	28				

TABLE of maximum and minimum temperatures in the vicinity of Beavermouth during May and June, 1909. Accompanying report of M. P. Bridgland, D.L.S., 1909.

MAY.				JUNE.			
	Max.	Min.	Water.	Max.	Min.	Water.	
1				79	41	49 (Bush River.)	
2				66	49	45	"
3				70	42	48	"
4				66	34	46	"
5				59	44	46	"
6				75	42	48	"
7				70	35	49	"
8				72	38	49	"
9				78	41	48	"
10				82	44	48	"
11				82	46	46	"
12				65	51	45	"
13				58	47	46	"
14				74	43	45	"
15				73	46	47	"
16				61	51	47	"
17					48	46	"
18				69	49	46	"
19					41	50 (Columbia River.)	
20		39	(Columbia River)		43	52	"
21	63	26.5	49 "	75	49	52	"
22	67	35	47 "		46	53	"
23	80.5	40	50 "			53	"
24	76	42	(Bush River)			54	"
25	58	42	45.5 "	70	45	53	"
26		44	44.5 "	66	32	55	"
27	78	48	48.5 "	68	45	55	"
28	73	44	45.5 "	69	42	55	"
29	66	38	45 "	74	45	55	"
30	62	39	45 "	77	42	56.5	"
31	73	39	49 "				

TABLE of maximum and minimum temperatures in the vicinity of the Shuswap Valley, during July, August, September, October, November, 1909.

	JULY.			AUGUST.			SEPTEMBER.		
	Max.	Min.	Water.	Max.	Min.	Water.	Max.	Min.	Water.
1	.....	.....	.....	81	51	70	76	45	68
2	80	43	72	70	49	68	76	48	69
3	86	48	74	75	47	68	81	47	72
4	85	48	76	74	48	68	78	46	72
5	83	52	70	.....	42	67	76	46	
6	60	49.5	68	78	39	66	77	43	
7	68	.....	.....	.....	40	68	78	46	
8	70	53	66	84	45	68	77	49	
9	72	52	66	80	54	69	79	55	
10	66	56	68	84	51	69	62	49	
11	70	56	64	.....	48	69	64	46	
12	67	51	66	85	46	72	71	48	
13	70	50	66	87	47	70	70	38	
14	82	40	64	86	48	70	67	42	
15	84	46	64	78	54	68	72	40	
16	79	52	66	.....	44	68	74	48	
17	76	40	64	86	45	68	62	32	
18	72	54	63	.....	45	68	59	44	
19	79	37.5	64	.....	.....	69	56	45	
20	82	40	64	.....	39	69	54	43	
21	84	41	66	76	50	68	.....	44	
22	84	50	66	71	37	67	62	38	
23	80	46	65	75	47	67	66	36	
24	82	49	66	61	43	66	73	45	
25	78	50	68	60	56	64	53	48	
26	76	50	68	70	.....	67	.....	31	
27	72	60	62	64	36	68	65	40	
28	77	55	64	74	39	68	60	56	
29	83	57	67	73	46	69	56	46	
30	.....	57	67	77	43	70	50	43	
31	88	51	70	73	44	69			

TABLE of maximum and minimum temperatures in the vicinity of the Shuswap Valley, during July, August, September, October, November, 1909—*Continued.*

OCTOBER.				NOVEMBER.		
	Max.	Min.	—	Max.	Min.	—
1	.....	27		44	32	
2	60	27		.....	29	
3	60	30		62	27	
4	65	38		48	30	
5	58	44		44	27	
6	..	29		48	25	
7	52	26		40	29	
8	44	32		.....	.....
9	58	42		44	29	
10	63	29		47	29	
11	58	28		41	25	
12	.....	42		33	18	
13	61	26		31	13	
14	60	25		28	7	
15	55	31		31	11	
16	51	26		30	28	
17	50	28		31	30	
18	52	34		33	31	
19	54	43		34	26	
20	56	30		28	19	
21	46	33		31	26	
22	49	38		31	31	
23	51	31		.....	28	
24	52	29		40	16	
25	57	34		29	14	
26	52	26		27	19	
27	49	34		28	20	
28	49	38		32	30	
29	.....	28		.....	.....
30	.....	38		.....	.....
31	46	28		.....	.....

MAP OF
LAND AGENCIES AND
SUB-AGENCIES
IN
BRITISH COLUMBIA RAILWAY BELT
1914

Scale: 35 miles to an inch

